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Research and Development in Industry: 1995–96

Funds, 1995 and 1996
Scientists and Engineers, January 1996 and January 1997

Detailed Statistical Tables

Division of Science Resources Studies
Directorate for Social, Behavioral, and Economic Sciences

National Science Foundation

December 1998

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Raymond M. Wolfe, Project Officer and Principal Author

Division of Science Resources Studies
Directorate for Social, Behavioral, and Economic Sciences
National Science Foundation
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INTRODUCTION

This report is the third of three publications containing results from the 1995 and 1996 cycles of the Survey of Industrial Research and Development. The first two publications, Data Briefs announcing the availability of survey results, contain analytical information and highlight the increase of industrial research and development (R&D) funded from companies' own resources during 1995 and 1996. This report, the Detailed Statistical Tables report, contains the full sets of statistics produced from the two cycles of the survey and provides statistics on research and development (R&D) funding for the years 1985–96 and on R&D personnel for the period from January 1986 to January 1997. (All three printed publications also are available on the World Wide Web at ***http://www.nsf.gov/sbe/srs/stats.htm***.)

This report provides national estimates of the expenditures on R&D performed within the United States by industrial firms, whether U.S. or foreign owned. Among the statistics are estimates of total R&D, the portion of the total financed by the Federal Government, and the portion financed by the companies themselves or by other non-Federal sources such as State and local governments or other industrial firms under contracts or subcontracts. Total R&D is also separated into its character-of-work components: basic research, applied research, and development. Other statistics include R&D financed by a domestic firm but performed outside the United States, R&D contracted to organizations outside of the firm, and the funds spent to perform energy-related R&D. This report also provides statistics on domestic net sales, number of employees, number of R&D-performing scientists and engineers, and cost per R&D scientist and engineer.

The Survey of Industrial Research and Development is an annual sample survey that intends to include or represent all for-profit, R&D-performing companies, either publicly or privately held. The survey's primary focus is on U.S. industry as a performer of, rather than as a source of funds for, R&D. Thus, data on Federal support of R&D activities performed by industry are collected and resulting statistics appear in several tables, but statistics on industrial funding of R&D undertaken at universities and colleges and other nonprofit organizations are not collected and therefore are not included in the tables.[1] The result of collecting and publishing performer-reported statistics is that the federally funded R&D performance totals presented in this report differ from the Federal R&D funding totals reported by the Federal agencies that provide the funds and data for the statistics published in NSF's *Federal Funds for Research and Development* report series. One reason for these differences is that performers of R&D often expend Federal funds in a year other than the one in which the Federal Government provides authorization, obligations, or outlays. (For definitions of these terms, see section C under Comparisons to Other Statistical Series.) During the past several years, the differences have widened between the Federal R&D funding reported by performers and that reported by funding agencies. These differences are documented and analyzed in *National Patterns of R&D Resources: 1996* (NSF 96-333).

Industry statistics in this report are developed from data collected from individual companies.[2] Since the survey is company based rather than establishment based, all data collected for the various subparts of each company (plants, divisions, or subdivisions) are tabulated in the major standard industrial classification (SIC) of the company. The resulting industry estimates are reported using the SIC of the companies within each industry. National totals are estimated by summing the industry estimates.

Prior to the 1994 cycle of the survey, all companies that spent more than $1 million annually on R&D in the United States or had 1,000 or more employees received a survey questionnaire every year. Beginning with the 1994 cycle, the employee cutoff was dropped from the criteria, and beginning with the 1996 cycle, the R&D level was raised to $5 million. For all cycles of the survey, the remaining firms (i.e., those that are not considered

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[1] Data on R&D performed at universities and colleges are collected in the annual Survey of Research and Development Expenditures at Universities and Colleges. Resumption of a survey of other nonprofit organizations, discontinued in the mid-1970's is underway. More information about these surveys is available from NSF's Research and Development Statistics Program in the Division of Science Resources Studies at the address given at the end of this introduction.

[2] In this survey and in the publications presenting statistics resulting from the survey, the terms company, firm, and enterprise are used synonymously.

"certainties" because of the selection criteria) are subjected to probability sampling and may or may not receive a questionnaire for a given survey year. Among the organizations purposely excluded from the survey are trade associations and not-for-profit consortia. Although their primary mission is to serve industry, these associations are established as nonprofit organizations.

Respondents receive detailed definitions to help them determine which expenses to include or exclude from the R&D data they provide. Nevertheless, the statistics presented in this report are subject to response and concept errors caused by differences in the way respondents interpret the definitions of R&D activities and by variations in company accounting procedures.

The National Science Foundation's (NSF's) Division of Science Resources Studies has sponsored and managed a survey of industrial R&D since 1953. The 1953–56 surveys were conducted by the Bureau of Labor Statistics (BLS), U.S. Department of Labor.[3] Since 1957, the Bureau of the Census, U.S. Department of Commerce, has conducted the survey.[4] Census staff conduct the survey under title 13 of the United States Code, which prohibits publication or release of data or statistics that may reveal information about individual companies. Therefore, in some tables of this report the symbol "(D)" is used as a footnote reference to indicate that estimates are being withheld to avoid possible disclosure of information about operations of individual companies.

The content of the survey has been expanded and refined over the years in response to an increasing need by policymakers for more detailed information on the Nation's R&D effort. For example, questions on energy R&D were added in the early 1970's, following the first oil-shortage crisis. On the other hand, the frequency of collection of certain data items has been reduced in recent years in an attempt to alleviate some of the respondent burden that has been placed on industry from all sources. For large firms known to perform R&D, a detailed questionnaire, form RD-1L, is used to collect data for odd-numbered years and an abbreviated version, form RD-1S, is used to collect data for even-numbered years. To further limit the reporting burden on small R&D performers and on firms that are included in the sample for the first time, an even more abbreviated form, form RD-1A, which collects only the most crucial data, is used each year.

Several changes have been made to the survey since the early 1990's that are of special importance to users of this report. Prior to the 1992 survey, statistics were based on samples selected at irregular intervals (i.e., 1967, 1971, 1976, 1981, and 1987). In intervening years, a subset of the last sample, a panel, was used. The most recent sample prior to the 1992 survey was selected and first used for survey year 1987. Original estimates for 1988 through 1991 were based on surveys of approximately 1,700 panel companies that reported R&D activity in the 1987 survey. Beginning with the 1992 survey, statistics were based on samples selected annually. Also, beginning with the 1992 survey, the sample size was increased from approximately 14,000 to approximately 25,000 firms. Annual sampling and the increase in sample size were instituted for several reasons: (1) to account better for births of R&D-performing establishments in the survey universe; (2) to more fully and accurately survey R&D performed by nonmanufacturing firms, especially in the service sector; and (3) to gather more current information about potential R&D performers.

Tables containing the statistics resulting from the 1995 and 1996 cycles of the survey are provided in section A. Detailed information about the history of the survey, survey methodology, comparability of the statistics, survey definitions, and other technical notes are provided in section B. Survey questionnaires, instructions, and other survey documents are reproduced in section C. Specific questions regarding the survey may be directed to Raymond Wolfe at (703) 306-1772, via e-mail at rwolfe@nsf.gov (Internet), or at the following mailing address:

Research and Development Statistics Program
Division of Science Resources Studies
National Science Foundation
4201 Wilson Boulevard, Suite 965
Arlington, VA 22230

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[3] See National Science Foundation, *Science and Engineering in American Industry: Final Report on a 1953–54 Survey* (NSF 56-16) and *Science and Engineering in American Industry: 1956* (NSF 59-50) (Washington, DC: Supt. of Documents, GPO, 1956 and 1960).

[4] Data obtained in the earlier BLS surveys are not directly comparable with Census figures because of methodological and other differences.

NOTE TO USERS OF HISTORICAL STATISTICS

To obtain accurate historical statistics for 1985–94, use only the detailed statistical tables in this report and not those published earlier. As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. Also, prior to the 1995 cycle of the survey, data for previous years were reviewed for consistency with current-year responses and were revised systematically during processing. This practice of routinely revising already-published statistics has been discontinued. Because of these changes, this report contains the latest revised statistics from the Survey of Industrial Research and Development for 1985–96. These changes and others are discussed in the technical notes in section B.

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CLASSIFICATION OF REPORTING UNITS

The basic reporting unit was the company, enterprise, or firm that included all establishments under common ownership or control. All research and development (R&D) expenditures and all scientists and engineers of each company were classified into a single standard industrial classification (SIC) code and size category.

COMPANY SIZE CLASS

Companies were categorized by their total number of domestic employees. The following are the six company size classes used in this report:

1. Fewer than 500 employees
2. 500 to 999 employees
3. 1,000 to 4,999 employees
4. 5,000 to 9,999 employees
5. 10,000 to 24,999 employees
6. 25,000 or more employees

CURRENT AND CONSTANT DOLLARS

Statistics in all tables are reported in current dollars. Constant dollars are also presented in the summary trend tables for 1995 (A-1, A-26, A-27, and A-28) and 1996 (A-1a, A-19a, A-20a, and A-21a). Gross domestic product (GDP) implicit price deflators were used to convert current to constant dollars.

DISCLOSURE AND SUPPRESSION OF STATISTICS

The Bureau of the Census conducts the survey under title 13 of the United States Code, which prohibits publication or release of data or statistics that may reveal information about individual companies. Therefore, the data in some of the table cells may have been deleted and replaced with "(D)." This occurs when a small number of companies account for a large percentage of the R&D funds or scientists and engineers in a particular data cell. Although publication of certain cells may be withheld, the estimates in the cells are always included in totals. The tables most often affected by this rule are those that contain data on Federal support to companies for R&D performance.

GEOGRAPHIC STATISTICS

The statistics cover only those operations located in the 50 States and the District of Columbia. Statistics on company-sponsored R&D performed outside the United States by foreign subsidiaries of U.S. domestic companies are included in 1995 tables A-11 and A-12, and in 1996 table A-11a, but are excluded from all other tables.

IMPUTATION

Missing data are imputed for some data items. Therefore, the statistics in some of the table cells may be accompanied by the notation "(S)," which indicates that the imputation rate—the percentage of the statistic not reported by respondents and consequently estimated—exceeds 50 percent for that item. In such cases the user should be aware that the estimate may be statistically unreliable. See tables B-4 and B-4a in section B for imputation rates for specific items.

INDUSTRY CLASSIFICATION

One SIC code was assigned to each company. A single SIC code was assigned to multiestablishment companies based on the code that represented the most dominant aggregated activity for that firm in terms of total payroll. Statistics for the following industry groupings are published in this report (SIC codes are shown in parentheses[1]):

Food, kindred, and tobacco products (20,21)
Food and kindred products (20)
Tobacco products (21)
Textiles and apparel (22,23)
Textiles mill products (22)
Apparel (23)
Lumber, wood products, and furniture (24,25)
Lumber and wood products, except furniture (24)

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[1] When the 1995 and 1996 samples were drawn, the 1987 revision of the SIC system was in effect.

- Furniture and fixtures (25)
- Paper and allied products (26)
- Printing, publishing and allied industries (27)
- Chemicals and allied products (28)
  - Industrial chemicals (281–82,286)
  - Drugs and medicines (283)
  - Other chemicals (284–85,287–89)
- Petroleum refining and extraction (13,29)
- Rubber products (30)
- Leather and leather goods (31)
- Stone, clay, and glass products (32)
- Primary metals (33)
  - Ferrous metals and products (331–32,3398–99)
  - Nonferrous metals and products (333–36)
- Fabricated metal products (34)
- Machinery (35)
  - Office, computing, and accounting machines (357)
  - Other machinery, except electrical (351–56, 358–59)
- Electrical equipment (36)
  - Radio and TV receiving equipment (365)
  - Communication equipment (366)
  - Electronic components (367)
  - Other electrical equipment (361–64,369)
- Transportation equipment (37)
  - Motor vehicles and motor vehicles equipment (371)
  - Other transportation equipment (373–75,379)
  - Aircraft and missiles (372,376)[2]
- Professional and scientific instruments (38)
  - Scientific and mechanical measuring instruments (381–82)
  - Optical, surgical, photographic, and other instruments (384–87)
- Miscellaneous manufacturing industries (39)
- Other manufacturing industries not elsewhere classified
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    - Other communications (482–484,489)
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  - Engineering and management services (87)
    - Engineering, architectural, and surveying (871)
    - Research, development and testing (873)
    - Other engineering and management services (872,874)
  - Other services (701,72,75–79,81,83,84,89)
- Other nonmanufacturing industries—agricultural services, forestry, fishing, hunting and mining (07–12,14); and construction (15–17).

PERCENTAGES

Percentages were calculated on the basis of thousands of dollars and may differ from those calculated using the rounded figures shown.

ROUNDING

Because of rounding, detail may not add to totals.

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[2] Because of the close similarity of their R&D activities, companies primarily engaged in the manufacture of ordnance and accessories, including complete guided missiles, are grouped with companies primarily engaged in the manufacture of aircraft and parts.

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[illegible] industrial R&D performance, by source of funds, in current and constant [illegible]

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Year	Total R&D		Federal		Company 1/	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]					
1953	$3,630	$17,988	$1,430	$7,086	$2,200	$10,902
1954	4,070	19,941	1,750	8,574	2,320	11,367
1955	4,640	22,372	2,180	10,511	2,460	11,861
1956	6,605	30,764	3,328	15,501	3,277	15,263
1957	7,731	34,856	4,335	19,545	3,396	15,311
1958	8,389	36,940	4,759	20,956	3,630	15,984
1959	9,618	41,908	5,635	24,553	3,983	17,355
1960	10,509	45,161	6,081	26,132	4,428	19,029
1961	10,908	46,338	6,240	26,508	4,668	19,830
1962	11,464	48,087	6,434	26,988	5,029	21,095
1963	12,630	52,363	7,270	30,141	5,360	22,222
1964	13,512	55,196	7,720	31,536	5,792	23,660
1965	14,185	56,831	7,740	31,010	6,445	25,821
1966	15,548	60,569	8,332	32,458	7,216	28,111
1967	16,385	61,854	8,365	31,578	8,020	30,276
1968	17,429	63,057	8,560	30,970	8,869	32,088
1969	18,308	63,262	8,451	29,202	9,857	34,060
1970	18,067	59,275	7,779	25,522	10,288	33,753
1971	18,320	57,143	7,666	23,911	10,654	33,231
1972	19,552	58,504	8,017	23,989	11,535	34,515
1973	21,249	60,195	8,145	23,074	13,104	37,122
1974	22,887	59,493	8,220	21,367	14,667	38,126
1975	24,187	57,465	8,605	20,444	15,582	37,021
1976	26,997	60,599	9,561	21,461	17,436	39,138
1977	29,825	62,882	10,485	22,106	19,340	40,776
1978	33,304	65,443	11,189	21,987	22,115	43,456
1979	38,226	69,212	12,518	22,665	25,708	46,547
1980	44,505	73,769	14,029	23,254	30,476	50,515
1981	51,810	78,488	16,382	24,817	35,428	53,671
1982	58,650	83,583	18,545	26,429	40,105	57,154
1983	65,268	89,213	20,680	28,267	44,588	60,946
1984	74,800	98,525	23,396	30,817	51,404	67,708
1985	84,239	107,270	27,196	34,631	57,043	72,638
1986	87,823	108,989	27,891	34,613	59,932	74,376
1987	92,155	110,950	30,752	37,024	61,403	73,926
1988	97,015	112,690	30,343	35,246	66,672	77,445
1989	102,055	113,748	28,554	31,826	73,501	81,923
1990	109,727	117,230	28,125	30,048	81,602	87,182

See explanatory information and SOURCE at end of table.

[illegible] source of funds [illegible]

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Year	Total R&D		Federal		Company 1/	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]					
1991	116,952	120,173	26,372	27,098	90,580	93,074
1992	119,110	119,110	24,722	24,722	94,388	94,388
1993	117,400	114,380	22,809	22,222	94,591	92,158
1994	119,595	113,802	22,463	21,375	97,131	92,426
1995	132,103	122,590	23,451	21,762	108,652	100,828

1/ Company-funded R&D includes funds for industrial R&D performed within company facilities from all sources except the Federal Government. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Company-financed R&D not performed within the company is excluded.

NOTES: 1992 gross domestic product (GDP) implicit price deflators were used to convert current dollars to constant dollars.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

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Industry and size of company	SIC code	Research and development funds						Domestic net sales		R&D scientists and engineers		Domestic employment	
		Total		Federal		Company				January 3/		March	
		1994	1995	1994	1995	1994	1995	1994	1995	1995	1996	1994	1995
		[Dollars in millions]								[In thousands]			
All Industries		$119,595	$132,103	$22,463	$23,451	$97,131	$108,652	$3,595,278	$3,921,561	749.2	832.8	17,443	17,759
Distribution by industry:													
Manufacturing		90,749	100,067	17,373	18,831	73,375	81,236	2,523,767	2,756,605	540.7	606.2	11,678	11,220
Food and kindred products	20	(D)	(D)	0	0	(D)	(D)	286,050	(D)	(D)	(D)	1,058	(D)
Tobacco products	21	(D)	(D)	0	0	(D)	(D)	16,478	(D)	(D)	(D)	47	(D)
Textile mill products	22	(D)	(D)	(D)	(D)	242	276	39,611	29,625	2.2	2.2	349	281
Apparel	23	(D)	(D)	(D)	(D)	74	106	10,673	12,852	0.9	1.6	97	107
Lumber and wood products, except furniture	24	46	(D)	0	(D)	48	84	12,740	12,056	0.5	0.7	84	74
Furniture and fixtures	25	(D)	(D)	(D)	(D)	155	145	19,454	19,913	1.8	2.2 (S)	253	160
Paper and allied products	26	(D)	(D)	(D)	(D)	1,263	1,404	130,358	138,086	10.6	11.0 (S)	696	547
Printing, publishing, and allied industries	27	318	(D)	0	(D)	318	306	48,022	39,781	3.5	3.3 (S)	367	341
Chemicals and allied products	28	(D)	17,547	(D)	210 (S)	16,559	17,337	322,039	371,302	91.5	94.3	1,225	1,211
Petroleum refining and extraction	13,29	1,950	1,760	10	6	1,939	1,754	235,280	245,662	9.0	8.4	376	324
Rubber products	30	(D)	(D)	(D)	(D)	1,432	1,210	62,223	76,816	8.8	10.2	456	485
Leather and leather products	31	40	(D)	0	(D)	40	40	7,089	6,534	0.3	0.3	46	37
Stone, clay, and glass products	32	591	448	38	6	553	441	35,778	30,363	4.3	3.9	221	173
Primary metals	33	690	593	17	13	672	580	116,624	115,664	6.7	4.1	482	465
Fabricated metal products	34	1,111	1,023	243	86	868	937	91,075	89,012	9.5	9.1	612	593
Machinery	35	8,110	(D)	99	(D)	8,011	9,676	210,835	269,689	66.3	87.3	1,143	1,172
Electrical equipment	36	15,338	18,751	1,801	1,690	13,537	17,060	259,693	315,070	105.5	125.8	1,433	1,384
Transportation	37	28,087	32,441	10,392	13,130	17,695	19,311	477,508	532,826	115.8	156.6	1,812	2,009
Professional and scientific instruments	38	11,441	11,976	3,384	3,460 (S)	8,058	8,516	124,541	116,696	90.6	70.9 (S)	791	710
Miscellaneous manufacturing industries	39	(D)	(D)	(D)	(D)	436	486	17,696	20,819	3.9	4.6	131	134

See explanatory information and SOURCE at end of table

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Industry and size of company	SIC code	Research and development funds						Domestic net sales		R&D scientists and engineers		Domestic employment	
		Total		Federal		Company				January 3/		March	
		1994	1995	1994	1995	1994	1995	1994	1995	1995	1996	1994	1995
		[Dollars in millions]								[In thousands]			
Distribution by industry:													
Nonmanufacturing 1/		$28,846	$32,036	$5,090	$4,620	$23,756	$27,415	$1,071,511	$1,164,955	208.5	226.6	5,765	6,538
Transportation and utilities	40–42,44–49	NA	5,435	NA	252	NA	5,183	NA	460,565	NA	29.3	NA	2,061
Communications	48	(D)	(D)	(D)	(D)	4,177	4,756	200,993	220,446	30.1	25.4	884	895
Telephone communications	481	NA	(D)	NA	(D)	NA	4,697	NA	218,474	NA	24.7	NA	887
Other communications	482–484,489	NA	59	NA	0	NA	59	NA	1,972	NA	0.8	NA	8
Electric, gas, and sanitary services	49	403	440	82	93	321	347	187,791	168,314	1.9	3.2 (S)	565	501
Other transportation and utilities	40–42,44–47	NA	(D)	NA	(D)	NA	80	NA	71,805	NA	0.7	NA	664
Trade	50–59	NA	(D)	NA	(D)	NA	7,514	NA	315,337	NA	47.5	NA	1,869
Finance, insurance, and real estate	60–65,67	NA	(D)	NA	(D)	NA	710	NA	105,961	NA	5.6	NA	415
Services	701,72,73,75–81,83,84,87,89	NA	17,876	NA	4,270	NA	13,606	NA	230,175	NA	139.6	NA	1,865
Business services	73	NA	9,293	NA	612	NA	8,681	NA	91,588	NA	80.2	NA	1,258
Computer and data processing services	737	NA	9,059	NA	514	NA	8,545	NA	76,697	NA	77.3	NA	518
Other business services	731–736,738	NA	234	NA	98	NA	136	NA	14,891	NA	3.0	NA	740
Health services	80	NA	756	NA	4	NA	753	NA	14,480	NA	5.0	NA	140
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	(D)	NA	(D)	NA	737	NA	13,812	NA	4.4	NA	116
Other health services	802-805,	NA	(D)	NA	(D)	NA	16 (S)	NA	668	NA	0.6	NA	24

See explanatory information and SOURCE at end of table.

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Industry and and size of company	SIC code	Research and development funds						Domestic net sales		R&D scientists and engineers		Domestic employment	
		Total		Federal		Company				January 3/		March	
		1994	1995	1994	1995	1994	1995	1994	1995	1995	1996	1994	1995
		[Dollars in millions]								[In thousands]			
Distribution by industry:													
Engineering and management services........	87	NA	7,662	NA	3,650	NA	4,011	NA	98,178	NA	52.9	NA	324
Engineering, architectural, and surveying................	871	NA	2,933	NA	1,883	NA	1,050	NA	51,343	NA	22.8 (S)	NA	202
Research, development, and testing..................	873	3,765	(D)	1,470	(D)	1,794	2,829	6,071	39,209	28.0	28.8	45	73
Other engineering and management services...	872,874	NA	(D)	NA	(D)	NA	$132	NA	$7,627	NA	1.4	NA	49
Other services..................	701,72,75–79, 81,83,84,89	NA	$165	NA	$4	NA	160	NA	25,929	NA	1.5	NA	142
Other nonmanufacturing industries 2/.........................	07–12,14,15, 161–162,17	NA	413	NA	11	NA	402	NA	52,917	NA	4.6	NA	329
Distribution by size of company: [Number of employees]													
Total......................................	....	$119,595	132,103	$22,463	23,451	$97,131	108,652	$3,595,278	3,921,561	749.2	832.8	17,443	17,759
Fewer than 500	....	13,966	16,662	1,164	1,978	12,802	14,684	343,987	374,478	137.5	165.1	2,316	1,935
500 to 999	....	3,608	4,693	182	225	3,426	4,468	116,833	147,062	30.1	36.6	706	835
1,000 to 4,999..............................	....	14,617	16,960	1,083	798	13,533	16,162	582,384	615,336	110.9	124.4	2,756	2,735
5,000 to 9,999..............................	....	8,912	9,532	825	243	8,087	9,289	400,872	466,186	62.2	61.1	1,748	1,916
10,000 to 24,999...........................	....	15,972	17,071	2,348	1,946 (S)	13,625	15,125	706,139	749,478	91.7	97.0	2,989	2,649
25,000 or more..............................	....	62,519	67,185	16,862	18,261	45,658	48,924	1,445,062	1,569,021	316.8	348.6	6,929	7,689

1/ Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

2/ Data for "Other nonmanufacturing industries" in 1994 excluded only SICs 48, 49, 737, 871, 806–807, and 873, which were the only nonmanufacturing industries shown separately.

3/ Data recorded in January represent employment figures for the previous year.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.
(N/A) = Not available.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
		[Dollars in millions]										
All Industries		$84,239	$87,823	$92,155	$97,015	$102,055	$109,727	$116,952	$119,110	$117,400	$119,595	$132,103
Distribution by industry:												
Manufacturing		77,525	80,377	84,311	86,503	88,024	88,934	88,506	90,177	86,569	90,749	100,067
Food, kindred, and tobacco products	20,21	(D)	(D)	1,206	(D)	(D)	(D)	1,277	1,386	1,345	1,476	1,566
Textiles and apparel	22,23	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Lumber, wood products, and furniture	24,25	147	144	137	(D)	192	216	(D)	(D)	(D)	(D)	(D)
Paper and allied products	26	(D)	(D)	(D)	(D)	879	1,059	(D)	(D)	(D)	(D)	(D)
Chemicals and allied products	28	8,540	8,843	9,635	11,067	12,069	13,291	14,648	15,381	(D)	(D)	17,547
Industrial chemicals	281-82,286	3,498	3,552	3,716	4,172	4,451	5,010	5,390	5,165	(D)	(D)	(D)
Drugs and medicines	283	(D)	3,658	(D)	4,906	(D)	(D)	(D)	7,944	9,146	9,633	10,215
Other chemicals	284-85,287–89	(D)	1,633	(D)	1,989	(D)	(D)	(D)	2,272	(D)	(D)	(D)
Petroleum refining and extraction	13,29	(D)	(D)	1,897	1,997	2,180	2,306	2,498	2,277	2,152	1,950	1,760
Rubber products	30	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Stone, clay, and glass products	32	(D)	950	995	(D)	(D)	(D)	(D)	(D)	538	591	448
Primary metals	33	(D)	(D)	730	637	686	739	714	522	669	690	593
Ferrous metals and products	331-32,3398–99	(D)	(D)	(D)	253	(D)	(D)	(D)	(D)	289	(D)	(D)
Nonferrous metals and products	333–36	416	458	(D)	384	(D)	(D)	(D)	(D)	380	(D)	(D)
Fabricated metal products	34	829	895	783	881	904	939	974	1,017	1,158	1,111	1,023
Machinery	35	12,216	(D)	(D)	(D)	(D)	14,446	14,775	14,938	8,381	8,110	(D)
Office, computing, and accounting machines	357	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	4,950	4,106	(D)
Other machinery, except electrical	351–56,358–59	(D)	2,396	2,428	2,682	2,729	(D)	(D)	(D)	3,431	4,004	5,041
Electrical equipment	36	14,432	14,980	15,848	14,128	13,318	13,400	13,415	13,360	13,349	15,338	18,751
Radio and TV receiving equipment	365	(D)	133	139	149	96	114	(D)	(D)	(D)	(D)	(D)
Communication equipment	366	9,397	9,669	10,184	8,427	7,071	5,928	4,787	(D)	(D)	(D)	(D)
Electronic components	367	3,385	(D)	4,286	4,133	4,025	3,914	(D)	3,567	5,311	6,032	(D)
Other electrical equipment	361-64,369	(D)	(D)	1,239	1,419	2,126	3,444	(D)	(D)	(D)	(D)	(D)
Transportation equipment	37	(D)	31,275	34,246	34,775	33,859	31,361	27,428	27,494	27,258	28,087	32,441
Motor vehicles and motor vehicles equipment	371	6,984	(D)	(D)	(D)	(D)	(D)	(D)	(D)	11,718	(D)	(D)
Other transportation equipment	373-75,379	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	483	(D)	(D)
Aircraft and missiles	372,376	22,231	21,050	24,458	24,168	22,331	20,635	16,629	17,158	15,056	14,260	16,951

See explanatory information and SOURCE at end of table.

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
		[Dollars in millions]										
Distribution by industry:												
Professional and scientific instruments	38	$5,013	$5,103	$5,222	$5,530	$5,992	$7,055	$8,705	$9,542	$10,119	$11,441	$11,976
Scientific and mechanical measuring instruments	381–82	(D)	(D)	(D)	1,959	2,366	3,346	(D)	5,156	5,681	6,952	7,146
Optical, surgical, photographic, and other instruments	384–87	(D)	(D)	(D)	3,571	3,626	3,709	(D)	4,386	4,438	4,489	4,831
Other manufacturing industries	27,31,39	(D)	382	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Nonmanufacturing 1/		6,714	7,446	7,844	10,513	14,031	20,793	28,446	28,933	30,831	28,846	32,036
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5,435
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Other communications	482-484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	59
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	440
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Trade	50–59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Services	701,72,73,75–81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA NA	17,876
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9,293
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA NA	9,059
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	234
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	756
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Other health services	802–805, 808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)

See explanatory information and SOURCE at end of table.

[illegible] R&D performance, by industry and size of company, 1985-95

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
		[Dollars in millions]										
Distribution by industry:												
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	$7,662
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2,933
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Other services	701,72,75–79, 81,83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	165
Other nonmanufacturing industries	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	413
Distribution by size of company: [Number of employees]												
Total		$84,239	$87,823	$92,155	$97,015	$102,055	$109,727	$116,952	$119,110	$117,400	$119,595	132,103
Fewer than 500		5,866	7,071	7,163	(S)	7,809	(S)	13,172	13,557	14,620	13,966	16,662
500 to 999		1,648	1,902	1,725	1,669	1,825	2,154	8,000	7,958	3,230	3,608	4,693
1,000 to 4,999		6,240	7,472	7,262	7,622	7,881	8,411	10,453	11,886	13,334	14,617	16,960
5,000 to 9,999		4,022	4,251	4,501	5,245	5,756	6,746	8,049	8,258	9,135	8,912	9,532
10,000 to 24,999		11,109	10,493	12,043	11,506	10,450	12,486	15,770	15,744	15,421	15,972	17,071
25,000 or more		55,354	56,991	59,461	63,694	68,335	71,030	61,508	61,707	61,659	62,519	67,185

1/ Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.
NA = Not available.

NOTE: As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

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Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[Dollars in millions]						
All industries		$132,103	$16,662	$4,693	$16,960	$9,532	$17,071	$67,185
Manufacturing		100,067	7,418	2,917	13,177	7,170	14,042	55,343
Food, kindred, and tobacco products	20,21	1,566	194	38	162	251	217	704
Textiles and apparel	22,23	(D)	55	42	176	13	79	(D)
Lumber, wood products, and furniture	24,25	(D)	40	13	74	72	(D)	(D)
Paper and allied products	26	(D)	28	24	139	57	171	(D)
Chemicals and allied products	28	17,547	638	288	3,760	1,434	5,869	5,558
Industrial chemicals	281–82,286	(D)	156	130	992	427	(D)	(D)
Drugs and medicines	283	10,215	248	(D)	2,290	(D)	3,679	3,231
Other chemicals	284–85,287–89	(D)	234	(D)	477	(D)	(D)	(D)
Petroleum refining and extraction	13,29	1,760	18	(D)	91	(D)	783	851
Rubber products	30	(D)	198	163	323	105	217	(D)
Stone, clay, and glass products	32	448	45	31	75	77	219	0
Primary metals	33	593	46	(D)	157	90	97	(D)
Ferrous metals and products	331–32,3398–99	(D)	10	(D)	61	(D)	(D)	(D)
Nonferrous metals and products	333–36	(D)	36	22	96	(D)	(D)	(D)
Fabricated metal products	34	1,023	199	77	234	166	348	0
Machinery	35	(D)	1,496	(D)	2,483	1,956	1,709	1,487
Office, computing, and accounting machines	357	(D)	385	(D)	1,491	1,307	(D)	(D)
Other machinery, except electrical	351–56,358–59	5,041	1,110	401	992	649	(D)	(D)
Electrical equipment	36	18,751	2,295	900	2,809	1,390	2,844	8,512
Radio and TV receiving equipment	365	(D)	29	(D)	78	0	0	0
Communication equipment	366	(D)	628	373	916	(D)	(D)	(D)
Electronic components	367	(D)	1,022	428	1,317	942	(D)	(D)
Other electrical equipment	361–64,369	(D)	616	(D)	498	(D)	251	2,407

See explanatory information and SOURCE at end of table.

Industry	SIC code	Total	Size of company: Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[Dollars in millions]						
Transportation equipment	37	$32,441	$86	$79 (S)	$608	$526	$719	$30,424
Motor vehicles and motor vehicles equipment	371	(D)	(D)	21	208	281	212	(D)
Other transportation equipment	373–75,379	(D)	(D)	(D)	86	0	(D)	(D)
Aircraft and missiles	372,376	16,951	15	(D)	314	245	(D)	16,042
Professional and scientific instruments	38	11,976	1,926	(D)	1,914	801	(D)	6,231
Scientific and mechanical measuring instruments	381–82	7,146	1,153	315	1,046	(D)	(D)	(D)
Optical, surgical, photographic, and other instruments	384–87	4,831	773	(D)	868	(D)	(D)	(D)
Other manufacturing industries	27,31,39	(D)	154	(D)	172	225	217	38
Nonmanufacturing		32,036	9,244	1,777	3,782	2,361	3,030	11,842
Transportation and utilities	40–42,44–49	5,435	112	(D)	162	58	(D)	4,927
Communications	48	(D)	37	(D)	53	(D)	0	4,793
Telephone communications	481	(D)	(D)	0	(D)	(D)	0	4,793
Other communications	482–484,489	59	(D)	(D)	(D)	0	0	0
Electric, gas, and sanitary services	49	440	(D)	0	82	42	166	(D)
Other transportation and utilities	40–42,44–47	(D)	(D)	0	27	(D)	(D)	(D)
Trade	50–59	(D)	959	168	945	359	(D)	(D)
Finance, insurance, and real estate	60–65,67	(D)	46	129	92	235	(D)	5,034
Services	701,72,73,75–81, 83,84,87,89	17,876	8,058	(D)	2,514	1,663	2,616	(D)
Business services	73	9,293	3,320	1,020	2,232	1,462	(D)	(D)
Computer and data processing services	737	9,059	3,187	(D)	2,180	(D)	(D)	(D)
Other business services	731–736,738	234	133	(D)	52	(D)	(D)	8

See explanatory information and SOURCE at end of table.

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[Dollars in millions]						
Health services	80	$756	$184	(D)	$16	$0	(D)	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	(D)	175	(D)	8	0	(D)	(D)
Other health services	802–805,808–809	(D)	8	$0	9	0	(D)	$0
Engineering and management services	87	7,662	4,514	352	227	(D)	(D)	(D)
Engineering, architectural, and surveying	871	2,933	1,229	(D)	102	(D)	(D)	(D)
Research, development, and testing	873	(D)	3,166	283	(D)	0	(D)	0
Other engineering and management services	872,874	(D)	119	(D)	(D)	(D)	(D)	0
Other services	701,72,75–79,81, 83,84,89	165	41	8	38	(D)	(D)	(D)
Other nonmanufacturing industries	07–12,14,15, 161–162,17	413	68	87	71	46	(D)	(D)

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates inputation of more than 50 percent

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible] R&D performance, by industry, size of company, and size of R&D program: [illegible]

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Industry and size of company	SIC code	Total	Size of R&D program: Less than $200,000	$200,000 to $999,999	$ 1 million to $9.999 million	$ 10 million to $99.999 million	$100 million or more
		[Dollars in millions]					
All industries		$132,103	$981	$4,111	$12,280	$23,959	$90,772
Distribution by industry:							
Manufacturing		100,067	608	1,935	7,473	15,845	74,207
Food, kindred, and tobacco products	20,21	1,566	(D)	194	174	743	(D)
Textiles and apparel	22,23	(D)	37	(D)	123	197	0
Lumber, wood products, and furniture	24,25	(D)	(D)	24	81	109	0
Paper and allied products	26	(D)	16	15	173	395	(D)
Chemicals and allied products	28	17,547	60	183	613	2,802	13,888
Industrial chemicals	281–82,286	(D)	(D)	40	245	995	4,040
Drugs and medicines	283	10,215	10	31	171	1,101	8,902
Other chemicals	284–85,287–89	(D)	(D)	113	198	706	947
Petroleum refining and extraction	13,29	1,760	(D)	(D)	57	366	1,326
Rubber products	30	(D)	25	139	315	472	(D)
Stone, clay, and glass products	32	448	12	28	60	348	0
Primary metals	33	593	(D)	28	189	236	(D)
Ferrous metals and products	331–32,3398–99	(D)	(D)	12	85	122	0
Nonferrous metals and products	333–36	(D)	4	16	104	114	(D)
Fabricated metal products	34	1,023	50	125	312	536	0
Machinery	35	(D)	(D)	278	1,491	2,821	5,035
Office, computing, and accounting machines	357	(D)	(D)	55	308	797	3,552
Other machinery, except electrical	351–56,35–59	5,041	128	223	1,183	2,024	1,483
Electrical equipment	36	18,751	89	308	1,887	3,256	13,211
Radio and TV receiving equipment	365	(D)	4	9	45	(D)	0
Communication equipment	366	(D)	(D)	64	523	1,006	2,768
Electronic components	367	(D)	(D)	69	701	1,589	7,837
Other electrical equipment	361–64,369	(D)	37	167	617	(D)	2,606

See explanatory information and SOURCE at end of table.

[illegible] funds for industrial R&D performance, by industry, size of company, and size of R&D program: [illegible]

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Industry and size of company	SIC code	Total	Size of R&D program: Less than $200,000	$200,000 to $999,999	$ 1 million to $9.999 million	$ 10 million to $99.999 million	$100 million or more
		[Dollars in millions]					
Distribution by industry:							
Transportation equipment	37	$32,441	$18	$45	$205	$912	$31,262
Motor vehicles and motor vehicles equipment	371	(D)	12	(D)	162	485	(D)
Other transportation equipment	373–75,379	(D)	(D)	0	25 (S)	133	(D)
Aircraft and missiles	372,376	16,951	(D)	(D)	17	294	16,630
Professional and scientific instruments	38	11,976	93	450	1,553	2,175	7,707
Scientific and mechanical measuring instruments	381–82	7,146	65	349	725	972	5,035
Optical, surgical, photographic, and other instruments	384–87	4,831	28	101	828	1,203	2,672
Other manufacturing industries	27,31,39	(D)	(D)	83	242	478	0
Nonmanufacturing		32,036	373	2,176	4,807	8,114	16,565
Transportation and utilities	40–42,44–49	5,435	1	26	302	505	4,602
Communications	48	(D)	(D)	(D)	63	223	4,602
Telephone communications	481	(D)	(D)	0	46	(D)	4,602
Other communications	482–484,489	59	(D)	(D)	17	(D)	0
Electric, gas, and sanitary services	49	440	0	11	203	226	0
Other transportation and utilities	40–42,44–47	(D)	(D)	(D)	35	56	0
Trade	50–59	(D)	120	528	352	1,491	(D)
Finance, insurance, and real estate	60–65,67	(D)	5	68	157	269	(D)
Services	701,72,73,75–81, 83,84,87,89	17,876	194	1,469	3,940	5,632	6,641
Business services	73	9,293	112	670	2,028	3,019	3,464
Computer and data processing services	737	9,059	82	646	1,896	2,970	3,464
Other business services	731–736,738	234	30	24	132	49	0

See explanatory information and SOURCE at end of table.

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Industry and size of company	SIC code	Total	Size of R&D program: Less than $200,000	$200,000 to $999,999	$ 1 million to $9.999 million	$ 10 million to $99.999 million	$100 million or more
		[Dollars in millions]					
Distribution by industry:							
Health services	80	$756	$24	$113	$55	(D)	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	(D)	(D)	109	46	(D)	(D)
Other health services	802–805,808–809	(D)	(D)	4	9	$0	$0
Engineering and management services	87	7,662	(D)	679	1,802	2,407	(D)
Engineering, architectural and surveying	871	2,933	40	(D)	619	579	(D)
Research, development, and testing	873	(D)	7	307	1,162	1,828	(D)
Other engineering and management services	872,874	(D)	(D)	(D)	21	0	0
Other services	701,72,75–79, 81,83,84,89	165	(D)	7	54	(D)	0
Other nonmanufacturing industries	07–12,14,15, 161–162,17	413	53	86	57	217	0
Distribution by size of company: [Number of employees]							
Total		132,103	981	4,111	12,280	23,959	90,772
Fewer than 500		16,662	(D)	3,695	8,022	3,863	(D)
500 to 999		4,693	(D)	247	1,461	2,828	(D)
1,000 to 4,999		16,960	2	137	2,194	9,099	5,527
5,000 to 9,999		9,532	3	21	304	3,387	5,817
10,000 to 24,999		17,071	(D)	(D)	193	3,232	13,641
25,000 or more		67,185	(D)	(D)	107	1,550	65,523

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

NOTE: As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufac industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

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Industry	SIC code	Total	Size of R&D program: Less than $200,000	$200,000 to $999,999	$ 1 million to $9.999 million	$ 10 million to $99.999 million	$100 million or more
		[Number of companies]					
All industries		33,314	18,378	9,852	4,081	851	152
Distribution by industry:							
Manufacturing		17,537	10,015	4,367	2,466	544	125
Food, kindred, and tobacco products	20,21	780	323	376	52	27	2
Textiles and apparel	22,23	623	514	55	44	10	0
Lumber, wood products, and furniture	24,25	690	593	53	38	7	0
Paper and allied products	26	239	148	30	45	14	2
Chemicals and allied products	28	1,600	827	500	160	78	35
Industrial chemicals	281–82,286	386	186	103	58	26	13
Drugs and medicines	283	339	159	88	48	25	19
Other chemicals	284–85,287–89	875	482	309	55	27	3
Petroleum refining and extraction	13,29	54	1	25	12	10	6
Rubber products	30	920	367	418	117	16	2
Stone, clay, and glass products	32	399	293	65	31	10	0
Primary metals	33	258	128	59	58	12	1
Ferrous metals and products	331–32,3398–99	73	23	22	21	7	0
Nonferrous metals and products	333–36	185	104	37	37	5	1
Fabricated metal products	34	1,392	979	285	110	17	0
Machinery	35	3,937	2,599	746	476	97	19
Office, computing, and accounting machines	357	426	133	179	73	28	14
Other machinery, except electrical	351–56,358–59	3,511	2,467	567	403	69	5
Electrical equipment	36	2,475	1,143	584	599	122	27
Radio and TV receiving equipment	365	84	52	14	16	2	0
Communication equipment	366	466	81	132	209	36	8
Electronic components	367	893	498	126	199	58	12
Other electrical equipment	361–64,369	1,032	512	311	176	26	7

See explanatory information and SOURCE at end of table.

[illegible] R&D-performing companies [illegible] and size of R&D program: 1995

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Industry	SIC code	Total	Size of R&D program: Less than $200,000	$200,000 to $999,999	$ 1 million to $9.999 million	$ 10 million to $99.999 million	$100 million or more
		[Number of companies]					
Distribution by industry:							
Transportation equipment	37	599	327	135	87	33	18
Motor vehicles and motor vehicles equipment	371	483	275	115	73	16	4
Other transportation equipment	373–75,379	31	13	0	10 (S)	6	2
Aircraft and missiles	372,376	85	39	19	4	11	12
Professional and scientific instruments	38	2,663	1,148	870	556	76	13
Scientific and mechanical measuring instruments	381–82	1,731	742	707	236	38	8
Optical, surgical, photographic, and other instruments	384–87	933	407	163	321	38	5
Other manufacturing industries	27,31,39	908	625	187	81	15	0
Nonmanufacturing		15,777	8,363	5,465	1,615	307	27
Transportation and utilities	40–42,44–49	249	27	48	151	19	4
Communications	48	99	26	26	35	8	4
Telephone communications	481	63	25	0	27	6	4
Other communications	482–484,489	37	1	26	8	2	0
Electric, gas, and sanitary services	49	132	0	20	105	7	0
Other transportation and utilities	40–42,44–47	18	1	2	11	4	0
Trade	50–59	5,727	3,951	1,623	106	43	5
Finance, insurance, and real estate	60–65,67	169	28	87	42	10	2
Services	701,72,73,75–81, 83,84,87,89	8,286	3,304	3,439	1,298	229	16
Business services	73	4,266	1,530	1,867	744	114	10
Computer and data processing services	737	3,557	908	1,804	724	111	10
Other business services	731–736,738	709	622	63	21	3	0

See explanatory information and SOURCE at end of table.

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Industry	SIC code	Total	Size of R&D program Less than $200,000	$200,000 to $999,999	$ 1 million to $9.999 million	$ 10 million to $99.999 million	$100 million or more
		[Number of companies]					
Distribution by industry:							
Health services	80	1,055	774	258	20	2	1
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	745	473	252	17	2	1
Other health services	802–805,808–809	310	301	6	3	0	0
Engineering and management services	87	2,666	738	1,296	517	110	5
Engineering, architectural, and surveying	871	1,052	443	378	209	20	2
Research, development, and testing	873	1,333	272	668	301	90	3
Other engineering and management services	872,874	281	24	250	7	0	0
Other services	701,72,75–79,81, 83,84,89	300	262	18	17	3	0
Other nonmanufacturing industries	07–12,14,15, 161–162,17	1,344	1,053	267	18	6	0
Distribution by size of company: [Number of employees]							
Total		33,314	18,378	9,852	4,081	851	152
Fewer than 500		30,284	18,198	8,977	2,894	214	1
500 to 999		1,235	127	568	431	109	1
1,000 to 4,999		1,217	27	254	612	293	31
5,000 to 9,999		274	23	33	82	111	25
10,000 to 24,999		172	3	11	41	82	35
25,000 or more		131	1	8	21	42	59

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
		[Dollars in millions]										
All Industries		$57,043	$59,932	$61,403	$66,672	$73,501	$81,602	$90,580	$94,388	$94,591	$97,131	$108,652
Distribution by industry:												
Manufacturing		52,642	55,192	56,259	59,415	63,199	65,251	67,639	71,025	69,901	73,375	81,236
Food, kindred, and tobacco products	20,21	1,136	1,280	1,204	1,173	1,244	1,248	1,277	1,386	1,345	1,476	1,566
Textiles and apparel	22,23	218	246	243	215	(S)	260	236	261	286	316	381
Lumber, wood products, and furniture	24,25	147	144	137	165	192	216	200	234	196	201	229
Paper and allied products	26	576	538	604	752	879	1,059	1,174	1,182	1,191	1,263	1,404
Chemicals and allied products	28	8,310	8,664	9,445	10,828	11,943	13,168	14,439	15,091	16,658	16,559	17,337
Industrial chemicals	281–82,286	3,281	3,374	3,531	3,939	4,340	4,902	5,225	4,911	5,165	4,780	5,139
Drugs and medicines	283	3,481	3,657	4,095	4,900	5,512	5,917	6,947	7,934	9,132	9,625	10,202
Other chemicals	284–85,287–89	1,548	1,633	1,819	1,989	2,091	2,349	2,267	2,246	2,361	2,154	1,996
Petroleum refining and extraction	13,29	2,194	1,971	1,883	1,975	2,162	2,289	2,487	2,268	2,138	1,939	1,754
Rubber products	30	659	655	596	718	867	1,056	(D)	1,256	1,059	1,432	1,210
Stone, clay, and glass products	32	825	941	985	697	615	538	455	479	529	553	441
Primary metals	33	730	786	711	620	666	717	706	514	646	672	580
Ferrous metals and products	331–32,3398–99	323	336	249	252	244	231	225	221	272	241	217
Nonferrous metals and products	333–36	407	450	462	368	422	486	481	293	374	431	363
Fabricated metal products	34	780	800	633	718	726	736	748	723	936	868	937
Machinery	35	10,721	10,701	10,577	11,929	13,342	13,575	13,720	13,903	8,295	8,011	9,676
Office, computing, and accounting machines	357	8,418	8,380	8,193	9,347	10,725	10,988	10,419	10,614	4,917	4,078	4,699
Other machinery, except electrical	351–56,358–59	2,303	2,321	2,384	2,582	2,618	2,587	3,301	3,289	3,378	3,933	4,976
Electrical equipment	36	9,271	9,767	10,449	9,975	9,575	9,267	8,865	9,516	11,682	13,537	17,060
Radio and TV receiving equipment	365	350	133	139	149	96	114	(D)	93	87	64	114
Communication equipment	366	5,174	5,117	5,455	4,798	4,159	3,584	(S)	3,381	3,954	4,939	3,845
Electronic components	367	2,826	3,357	3,630	3,684	3,655	3,496	3,177	3,320	5,105	5,870	9,628
Other electrical equipment	361–64,369	921	1,160	1,225	1,345	1,664	2,073	(D)	2,722	2,537	2,664	3,473
Transportation equipment	37	12,092	13,567	13,462	13,910	14,596	14,264	14,858	16,292	16,640	17,695	19,311
Motor vehicles and motor vehicles equipment	371	6,164	7,171	7,167	7,783	8,756	8,594	9,063	9,132	10,659	11,950	13,590
Other transportation equipment	373–75,379	279	330	356	361	337	283	262	289	297	279	232
Aircraft and missiles	372,376	5,649	6,066	5,939	5,766	5,503	5,387	5,533	6,871	5,684	5,466	5,489

See explanatory information and SOURCE at end of table.

Table A-7. Company and other (except Federal) funds for industrial R&D performance, by industry and size of company: 1985–95

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
		[Dollars in millions]										
Distribution by industry:												
Professional and scientific instruments	38	$4,622	$4,752	$4,950	$5,339	$5,729	$6,318	$6,840	$7,321	$7,542	$8,058	$8,516
Scientific and mechanical measuring instruments	381–82	1,596	1,521	1,598	1,863	2,205	2,696	3,017	3,013	3,196	3,687	3,787
Optical, surgical, photographic, and other instruments	384–87	3,026	3,231	3,352	3,476	3,524	3,621	3,823	4,308	4,346	4,371	4,729
Other manufacturing industries	27,31,39	361	380	380	401	438	541	(D)	599	758	796	835
Nonmanufacturing 1/		4,401	4,740	5,144	7,257	10,302	16,351	22,941	23,363	24,690	23,756	27,415
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5,183
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4,756
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4,697
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	59
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	347
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80
Trade	50–59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7,514
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	710
Services	701,72,73,75–81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	13,606
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8,681
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8,545
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	136
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	753
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	737
Other health services	802–805,808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	16
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4,011
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,050
Research, development, and testing	873	NA	874	NA	875	NA	876	NA	877	NA	878	NA
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	132

See explanatory information and SOURCE at end of table.

[illegible] Non-Federal funds for industrial R&D performance, by industry and size of company: 1985–95

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
		[Dollars in millions]										
Distribution by industry:												
Other services	701,72,75–79,81, 83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	$160
Other nonmanufacturing industries	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	402
Distribution by size of company: [Number of employees]												
Total		$57,043	$59,932	$61,403	$66,672	$73,501	$81,602	$90,580	$94,388	$94,591	$97,131	108,652
Fewer than 500		5,127	6,203	6,200	(S)	(S)	(S)	11,285	11,532	13,006	12,802	14,684
500 to 999		1,531	1,765	1,610	1,748	1,934	2,144	7,819	7,807	3,048	3,426	4,468
1,000 to 4,999		5,249	6,243	6,281	6,820	7,546	8,363	9,403	10,865	12,219	13,533	16,162
5,000 to 9,999		3,350	3,455	3,753	4,075	4,509	4,997	7,233	7,495	8,371	8,087	9,289
10,000 to 24,999		8,366	8,489	9,681	10,512	11,631	12,890	12,397	12,328	12,606	13,625	15,125
25,000 or more		33,420	33,777	33,878	36,785	40,703	45,106	42,443	44,361	45,340	45,658	48,924

1/ Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY:
(D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.
NA = Not available.

NOTES: Company-funded R&D includes funds for industrial R&D performed within company facilities from all sources except the Federal Government. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Company-financed R&D not performed within the company is excluded.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible] federal funds for industrial R&D performance, by industry and size of company [illegible]

Page 1 of 3

Industry	SIC code	Total	Size of company: Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars in millions]					
All industries		$108,652	$14,684	$4,468	$16,162	$9,289	$15,125	$48,924
Manufacturing		81,236	7,209	2,816	12,669	7,067	13,132	38,342
Food, kindred, and tobacco products	20,21	1,566	194	38	162	251	217	704
Textiles and apparel	22,23	381	54	42	176	(D)	79	(D)
Lumber, wood products, and furniture	24,25	229	37	13	74	72	(D)	(D)
Paper and allied products	26	1,404	28	24	139	57	171	985 (S)
Chemicals and allied products	28	17,337	620	288	3,749	1,428	5,697	5,554
Industrial chemicals	281–82,286	5,139	156	130	984	422	(D)	(D)
Drugs and medicines	283	10,202	238	(D)	2,288	(D)	3,678	3,231
Other chemicals	284–85,287–89	1,996	226	(D)	477	(D)	(D)	(D)
Petroleum refining and extraction	13,29	1,754	18	(D)	91	(D)	779	848
Rubber products	30	1,210	198	163	323	(D)	141	(D)
Stone, clay, and glass products	32	441	44	30	70	77	219	0
Primary metals	33	580	45	(D)	156	86	97	(D)
Ferrous metals and products	331–32,3398–99	217	10	(D)	61	(D)	(D)	(D)
Nonferrous metals and products	333–36	363	35	22	95	(D)	(D)	(D)
Fabricated metal products	34	937	193	76	234	132	302	0
Machinery	35	9,676	1,485	630	2,477	1,950	1,670	1,465
Office, computing, and accounting machines	357	4,699	378	230	1,486	1,302	(D)	(D)
Other machinery, except electrical	351–56,358–59	4,976	1,106	400	991	647	(D)	(D)
Electrical equipment	36	17,060	2,218	887	2,781	1,381	2,844	6,949
Radio and TV receiving equipment	365	114	29	10	75	0	0	0
Communication equipment	366	3,845	582	370	913	(D)	(D)	(D)
Electronic components	367	9,628	994	418	1,296	(D)	(D)	(D)
Other electrical equipment	361–64,369	3,473	612	88	498	168	251	1,856
Transportation equipment	37	19,311	81	62 (S)	516	500	307	17,845
Motor vehicles and motor vehicles equipment	371	13,590	(D)	21	208	281	212	(D)

See explanatory information and SOURCE at end of table.

[illegible] R&D performance, by industry, and [illegible] size of company [illegible]

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Industry	SIC code	Total	Size of company: Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars in millions]					
Other transportation equipment	373–75,379	$232	(D)	(D)	$86	$0	(D)	(D)
Aircraft and missiles	372,376	5,489	$10	(D)	221	219	(D)	$4,953
Professional and scientific instruments	38	8,516	1,841	$498	1,551	(D)	(D)	3,452
Scientific and mechanical measuring instruments	381–82	3,787	1,082	255	683	(D)	(D)	(D)
Optical, surgical, photographic, and other instruments	384–87	4,729	759	244	868	621	(D)	(D)
Other manufacturing industries	27,31,39	835	154	30	172	225	$216	38
Nonmanufacturing		27,415	7,475	1,652	3,492	2,222	1,993	10,581
Transportation and utilities	40–42,44–49	5,183	(D)	(D)	131	58	149	4,726
Communications	48	4,756	(D)	(D)	53	(D)	0	4,647
Telephone communications	481	4,697	(D)	0	(D)	(D)	0	4,647
Other communications	482–484,489	59	36	(D)	(D)	0	0	0
Electric, gas, and sanitary services	49	347	(D)	0	64	42	(D)	(D)
Other transportation and utilities	40–42,44–47	80	(D)	0	14	(D)	(D)	(D)
Trade	50–59	7,514	959	(D)	945	359	(D)	4,959
Finance, insurance, and real estate	60–65,67	710	46	117	92	235	(D)	(D)
Services	701,72,73,75–81, 83,84,87,89	13,606	6,295	1,274	2,254	1,529	1,599	655
Business services	73	8,681	2,812	998	2,151	1,462	(D)	(D)
Computer and data processing services	737	8,545	2,769	977	2,099	(D)	(D)	(D)
Other business services	731–736,738	136	43	21 (S)	52	(D)	(D)	8
Health services	80	753	182	(D)	16	0	(D)	(D)
Offices and clinics of medical doctors, hospital, medical and dental labs	801,806,807	737	(D)	(D)	8	0	(D)	(D)
Other health services	802–805,808–809	16 (S)	(D)	0	8	0	(D)	0

See explanatory information and SOURCE at end of table.

[illegible] except Federal funds for industrial R&D performance, by industry and size of company: 1995

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Industry	SIC code	Total	Size of company: Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars in millions]					
Engineering and management services.....	87	$4,011	$3,264	$261	$49	(D)	(D)	(D)
Engineering, architectural, and surveying....................................	871	1,050	596	36	30	(D)	(D)	(D)
Research, development, and testing.....	873	2,829	2,550	(D)	(D)	$0	(D)	$0
Other engineering and management services..	872,874	132	117	(D)	(D)	(D)	(D)	0
Other services..	701,72,75–79,81, 83,84,89	160	37	(D)	38	(D)	(D)	(D)
Other nonmanufacturing industries..................	07–12,14,15, 161-162,17	402	(D)	87	71	42	$2	(D)

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible]

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Industry and size of company	SIC code	1991	1993	1994	1995
		[Dollars in millions]			
All Industries		$3,319	$3,462	$3,618	$5,177
Distribution by industry:					
Manufacturing		2,577	2,339	2,450	3812
Food, kindred, and tobacco products	20,21	44	43	43	41
Textiles and apparel	22,23	(D)	2	4	1
Lumber, wood products, and furniture	24,25	(D)	8	8	7
Paper and allied products	26	12	5	4	14
Chemicals and allied products	28	1,087	1,117	1,239	2386
Industrial chemicals	281–82,286	95	43	38	259
Drugs and medicines	283	771	942	1,055	1751
Other chemicals	284–85,287–89	221	132	146	376
Petroleum refining and extraction	13,29	35	56	52	32
Rubber products	30	18	65	22	32
Stone, clay, and glass products	32	(D)	2	6	2
Primary metals	33	24	12	15	13
Ferrous metals and products	331–32,3398–99	4	8	10	5
Nonferrous metals and products	333–36	20	4	5	8
Fabricated metal products	34	3	21	21	10
Machinery	35	256	125	200	201
Office, computing, and accounting machines	357	229	52	113	84
Other machinery, except electrical	351–56,358–59	27	73	87	117
Electrical equipment	36	114	143	116	194
Radio and TV receiving equipment	365	0	(D)	1	2
Communication equipment	366	63	20	38	40
Electronic components	367	38	24	24	75
Other electrical equipment	361–64,369	13	(D)	54	77
Transportation equipment	37	687	(D)	591	(D)
Motor vehicles and motor vehicles equipment	371	(D)	(D)	(D)	(D)
Other transportation equipment	373–75,379	(S)	(D)	(D)	5
Aircraft and missiles	372,376	(D)	52	83	72
Professional and scientific instruments	38	(D)	189	57	114
Scientific and mechanical measuring instruments	381–82	4	25	16	45
Optical, surgical, photographic, and other instruments	384–87	(D)	163	40	68
Other manufacturing industries	27,31,39	2	(D)	72	(D)
Nonmanufacturing 1/		742	1,123	1,168	1365
Transportation and utilities	40–42,44–49	NA	NA	NA	509
Communications	48	NA	NA	NA	264
Telephone communications	481	NA	NA	NA	(D)
Other communications	482–484,489	NA	NA	NA	(D)
Electric, gas, and sanitary services	49	NA	NA	NA	219
Other transportation and utilities	40–42,44–47	NA	NA	NA	27

See explanatory information and SOURCE at end of table.

[illegible]

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Industry and size of company	SIC code	1991	1993	1994	1995
		[Dollars in millions]			
Distribution by industry:					
Trade	50–59	NA	NA	NA	$346
Finance, insurance, and real estate	60–65,67	NA	NA	NA	92
Services	701,72,73,75–81, 83,84,87,89	NA	NA	NA	416
Business services	73	NA	NA	NA	151
Computer and data processing services	737	NA	NA	NA	139
Other business services	731–736,738	NA	NA	NA	12
Health services	80	NA	NA	NA	38
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	(D)
Other health services	802–805,808–809	NA	NA	NA	(D)
Engineering and management services	87	NA	NA	NA	200
Engineering, architectural, and surveying	871	NA	NA	NA	13
Research, development, and testing	873	NA	NA	NA	187
Other engineering and management services	872,874	NA	NA	NA	0
Other services	701,72,75–79,81, 83,84,89	NA	NA	NA	27
Other nonmanufacturing industries	07–12,14,15, 161–162,17	NA	NA	NA	1
Distribution by size of company: [Number of employees]					
Total		$3,319	$3,462	$3,618	5177
Fewer than 500		(S)	751	724	674
500 to 999		35	107	126	174
1,000 to 4,999		275	310	397	632
5,000 to 9,999		218	327	408	393
10,000 to 24,999		881	468	391	786
25,000 or more		1,762	1,497	1,574	2518

1/ Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.
NA = Not available.

NOTE: As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[redacted]

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Industry	SIC code	Total		Size of company											
				Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside
All industries		33,314	5,338	30,284	4,774	1,235	206	1,217	201	274	76	172	40	131	40
Manufacturing		17,537	2,545	15,400	2,119	794	176	955	146	179	54	131	28	78	22
Food, kindred, and tobacco product	20,21	780	24	629	8	45	3	72	3	12	5	12	3	10	2
Textiles and apparel	22,23	623	8	527	2	41	2	38	3	6	1	9	0	2	0
Lumber, wood products, and furniture	24,25	690	57	610	43	31	10	40	4	7	0	1	0	1	0
Paper and allied products	26	239	14	160	0	17	0	41	11	7	1	9	1	6	1
Chemicals and allied products	28	1,600	404	1,386	336	59	9	89	22	39	24	19	7	8	6
Industrial chemicals	281–82,286	386	15	304	4	36	1	29	6	5	0	9	2	3	2
Drugs and medicines	283	339	102	288	81	10	5	26	8	3	1	8	4	4	3
Other chemicals	284–85,287–89	875	288	794	251	13	3	34	8	31	23	2	1	1	1
Petroleum refining and extraction	13,29	54	11	28	1	1	0	10	3	2	0	9	5	4	2
Rubber products	30	920	128	769	98	75	22	61	5	8	1	4	1	2	1
Stone, clay, and glass products	32	399	58	344	48	26	6	22	4	3	0	4	0	0	0
Primary metals	33	258	116	150	91	36	5	50	10	14	6	5	3	3	1
Ferrous metals and products	331–32,3398–99	73	13	17	2	11	0	30	3	12	6	2	1	1	1
Nonferrous metals and products	333–36	185	102	132	89	25	5	20	7	2	0	3	2	2	0
Fabricated metal products	34	1,392	65	1,233	39	68	10	69	10	8	2	14	4	0	0
Machinery	35	3,937	231	3,613	172	131	35	150	17	22	4	15	1	6	2
Office, computing, and accounting machines	357	426	16	377	10	15	0	25	4	6	1	2	0	1	1
Other machinery, except electrical	351–56,358–59	3,511	215	3,236	162	116	35	125	13	16	3	13	1	5	1
Electrical equipment	36	2,475	608	2,195	560	111	21	133	20	15	5	9	0	12	2
Radio and TV receiving equipment	365	84	36	75	35	3	1	6	0	0	0	0	0	0	0
Communication equipment	366	466	109	404	97	32	6	24	5	2	1	2	0	2	0
Electronic components	367	893	247	786	233	39	6	56	6	7	1	2	0	3	1
Other electrical equipment	361–64,369	1,032	215	930	195	37	7	47	9	6	3	5	0	7	1

See explanatory information and SOURCE at end of table.

Table A-[illegible]. Number of R&D-performing companies contracting R&D performance to outside organizations and total number of R&D-performing companies, by industry and size of company: 1995

Page 2 of 3

Industry	SIC code	Total		Size of company: Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside
Transportation equipment	37	599	120	462	81	35	25	63	9	15	1	9	1	15	3
Motor vehicles and motor vehicles equipment	371	483	100	390	69	29	24	46	4	9	1	5	1	4	1
Other transportation equipment	373–75,379	31	17	14	13	3	1	9	3	0	0	3	0	2	0
Aircraft and missiles	372,376	85	4	58	0	3	0	8	2	6	0	1	0	9	2
Professional and scientific instruments	38	2,663	598	2,489	564	89	17	68	14	9	2	2	0	6	1
Scientific and mechanical measuring instruments	381–82	1,731	305	1,667	295	33	6	23	3	3	0	1	0	4	1
Optical, surgical, photographic, and other instruments	384–87	933	293	823	268	56	11	45	11	6	2	1	0	2	0
Other manufacturing industries	27,31,39	908	101	805	76	30	11	48	10	11	1	10	2	3	1
Nonmanufacturing		15,777	2,793	14,884	2,656	441	29	262	55	95	23	41	12	53	18
Transportation and utilities	40–42,44–49	249	63	123	4	2	0	70	29	18	13	15	7	21	10
Communications	48	99	10	58	4	2	0	27	0	1	0	0	0	11	6
Telephone communications	481	63	6	25	0	0	0	25	0	1	0	0	0	11	6
Other communications	482–484,489	37	4	32	4	2	0	2	0	0	0	0	0	0	0
Electric, gas, and sanitary services	49	132	48	64	0	0	0	38	28	16	12	13	6	2	2
Other transportation and utilities	40–42,44–47	18	5	2	0	0	0	5	1	1	1	2	1	8	2
Trade	50–59	5,727	1,173	5,593	1,155	22	4	52	9	40	1	5	2	15	2
Finance, insurance, and real estate	60–65,67	169	12	74	1	57	0	15	2	16	5	2	1	5	3
Services	701,72,73,75–81,83,84,87,89	8,286	1,535	8,034	1,496	100	20	109	12	17	3	16	2	10	3
Business services	73	4,266	902	4,106	876	68	16	68	7	10	3	7	0	7	1
Computer and data processing services	737	3,557	588	3,429	570	56	9	57	5	7	3	5	0	3	1
Other business services	731–36,738	709	314	677	306	12	7	11	2	3	0	2	0	4	0

See explanatory information and SOURCE at end of table.

Table A-[illegible]. Number of R&D-performing companies contracting R&D performance to outside organizations and total number of R&D-performing companies, by industry and size of company: 1995

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Industry	SIC code	Total		Size of company											
				Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside
Health services	80	1055	193	1036	190	6	0	9	1	0	0	3	1	1	1
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	745	192	730	189	6	0	5	1	0	0	2	1	1	1
Other health services	802–805, 808–809	310	1	306	1	0	0	3	0	0	0	1	0	0	0
Engineering and management services	87	2666	434	2613	429	22	3	24	3	3	0	3	0	1	0
Engineering, architectural, and surveying	871	1052	82	1013	76	15	3	20	3	2	0	1	0	1	0
Research, development, and testing	873	1333	352	1324	352	6	0	2	0	0	0	1	0	0	0
Other engineering and management services	872,874	281	0	276	0	1	0	2	0	1	0	1	0	0	0
Other services	701,72,75–79, 81,83,84,89	300	5	279	1	4	1	8	1	4	0	3	1	1	1
Other nonmanufacturing industries	07–12,14,15, 161–162,17	1344	9	1059	0	259	5	16	3	5	1	3	0	2	0

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[redacted]

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Industry	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
		[Dollars in millions]										
Total		$3,650	$4,624	$5,226	$6,208	$6,706	$7,952	$9,147	$10,063	$9,565	$9,395	$13,052
Food, kindred, and tobacco products	20,21	75	69	37	27	42	41	66	88	112	117	142
Chemicals and allied products	28	843	1,071	1,243	1,548	1,532	2,007	2,401	2,676	2,833	2,456	4,194
Industrial and other chemicals	281—2,28-89	444	579	625	855	609	720	1,009	1,045	1,318	917	1,632
Drugs and medicines	283	399	492	618	693	923	1,287	1,392	1,631	1,516	1,539	2,562
Petroleum refining and extraction	13,29	47	40	47	59	47	76	107	119	104	111	76
Stone, clay, and glass products	32	(D)	(D)	(D)	(D)	(D)	59	38	41	38	27	31
Primary metals	33	(D)	(D)	18	23	24	26	20	18	12	15	26
Fabricated metal products	34	21	26	40	(D)	(D)	95	86	109	119	125	111
Machinery	35	689	951	1,233	1,326	1,432	1,451	1,476	1,439	340	308	501
Electrical equipment	36	591	(S)	432	591	573	770	651	568	525	495	872
Radio and TV receiving equipment	365	(D)	(D)	0	(D)	(D)	(D)	2	(D)	(D)	3	(D)
Communication equipment	366	(D)	(D)	188	290	199	174	151	(D)	(D)	110	(D)
Electronic components	367	117	150	204	246	160	185	164	168	322	276	437
Other electrical equipment	361–64,369	24	25	39	(D)	(D)	(D)	334	217	113	107	291
Transportation equipment	37	1,025	(D)	(D)	1,750	1,916	2,055	2,402	(D)	(D)	(D)	(D)
Motor vehicles and other transportation equipment	371,373–75,379	(D)	(D)	(D)	1,477	1,501	1,901	2,166	(D)	(D)	(D)	(D)
Aircraft and missiles	372,376	(D)	182	237	273	415	154	236	493	(D)	251	284
Professional and scientific instruments	38	169	212	317	404	474	611	656	685	751	900	988
Other manufacturing industries	22–27,30–31,39	125	141	138	178	269	344	467	524	(D)	572	(D)
Nonmanufacturing industries 1/	07–10,12–17,40–42, 44–49,50–59,60–65, 67,701,73,75–76,78–79, 80–81,83–84,87,89	18	27	64	146	256	415	778	835	1,770	1,500	2,206

1/ Nonmanufacturing industries for 1990 and prior years included the following SICs only: 10–11, 14–17, 40–42, 44–51, 53–54, 56, 60, 62–63, 72–73, 78, 806–07, and 87.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

NOTES: Data are reported in current U.S. dollars.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

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Location of foreign subsidiary	Number of companies	Total (Dollars in millions)
Total 1/	652	$13,052
Distributed by country:		
Canada	125	383
Germany	110	2,241
France	105	1,121
Japan	79	971
United Kingdom	184	1,034
Other countries	228	781
Undistributed 2/	370	6,521
Distributed by companies with R&D expenditures in one or more countries:		
Total	652	13,052
One country	186	677
Two countries	62	221
Three countries	23	168
Four countries	7	52
Five countries	3	(D)
More than five countries	1	(D)
Undistributed 2/ 3/	370	11,910

1/ Detail does not add to total because categories are not mutually exclusive.

2/ Includes data reported on form RD-1L that were not allocated to a specific country, and total foreign R&D reported on Form RD-1A. Form RD-1A does not collect data by country.

3/ To avoid double counting, if a company reported ANY foreign R&D expenditures that were not allocated to specific countries, all foreign R&D expenditures, including those that may have been allocated to specific countries, are included in this cell. For example, if a company allocated a portion of its foreign R&D expenditures to Canada and left the remainder unallocated, ALL of its foreign R&D is included in this cell because it could not be determined during processing how many other countries were sites of R&D performance.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

NOTE: Data are reported in current U.S. dollars.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
		[Dollars in millions]										
All Industries		$27,196	$27,891	$30,752	$30,343	$28,554	$[illegible],125	$26,372	$24,722	$22,809	$22,463	$23,451
Distribution by industry:												
Manufacturing		24,883	25,185	28,052	27,088	24,826	23,683	20,867	19,152	16,669	17,373	18,831
Food, kindred, and tobacco products	20,21	(D)	(D)	2	(D)	(D)	(D)	0	0	0	0	0
Textiles and apparel	22,23	(D)	(D)	(D)	(D)	(D)	(D)	(S)	(D)	(D)	(D)	(D)
Lumber, wood products, and furniture	24,25	0	0	0	(D)	0	0	(D)	(D)	(D)	(D)	(D)
Paper and allied products	26	(D)	(D)	(D)	(D)	0	0	(D)	(D)	(D)	(D)	(D)
Chemicals and allied products	28	230	179	190	238	126	123	209	(S)	(D)	(D)	210 (S)
Industrial chemicals	281–82,286	217	178	185	232	111	109	165	(S)	(D)	(D)	(D)
Drugs and medicines	283	(D)	1	(D)	6	(D)	(D)	(D)	(S)	15	8	14
Other chemicals	284–85,287–89	(D)	0	(D)	0	(D)	(D)	(D)	(S)	(D)	(D)	(D)
Petroleum refining and extraction	13,29	(D)	(D)	14	22	(S)	(S)	11	9	14	10	6
Rubber products	30	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Stone, clay, and glass products	32	(D)	9	10	(D)	(D)	(D)	(D)	(D)	9	38	6
Primary metals	33	(D)	(D)	19	17	22	(D)	8	(S)	23	17	13
Ferrous metals and products	331–32,3398–99	(D)	(D)	(D)	1	(D)	(D)	1	(D)	17	(D)	(D)
Nonferrous metals and products	333–36	9	8	(D)	16	(D)	(D)	7	(D)	6	(D)	(D)
Fabricated metal products	34	49	95	150	163	178	203	226	294	222	243	86
Machinery	35	1,495	(D)	(D)	(D)	(D)	871	1,055	1,035	86	99	(D)
Office, computing, and accounting machines	357	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	33	28	(D)
Other machinery, except electrical	351–56,358–59	(D)	75	44	101	112	(D)	(D)	(D)	53	71	64
Electrical equipment	36	5,161	5,213	5,399	4,153	3,743	4,133	4,550	3,844	1,667	1,801	1,690
Radio and TV receiving equipment	365	(D)	0	0	0	0	0	0	(D)	(D)	(D)	(D)
Communication equipment	366	4,223	4,552	4,729	3,630	2,911	2,344	(D)	(D)	(D)	(D)	(D)
Electronic components	367	559	(D)	656	449	369	418	(D)	247	206	162	(D)
Other electrical equipment	361–64,369	(D)	(D)	14	74	463	1,371	(D)	(D)	(D)	(D)	(D)
Transportation equipment	37	(D)	17,708	20,784	20,865	19,262	17,097	12,570	11,202	10,617	10,392	13,130
Motor vehicles and motor vehicles equipment	371	820	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Other transportation equipment	373–75,379	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Aircraft and missiles	372,376	16,582	14,984	18,519	18,402	16,828	15,248	11,096	(S)	9,372	8,794	11,462

See explanatory information and SOURCE at end of table.

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
		[Dollars in millions]										
Distribution by industry:												
Professional and scientific instruments	38	$391	$351	$272	$191	$263	$737	$1,865	$2,221	$2,577	$3,384	$3,460 (S)
Scientific and mechanical measuring instruments	381–82	(D)	(D)	(D)	(S)	(S)	(S)	(D)	2,143	2,484	3,266	3,358 (S)
Optical, surgical, photographic, and other instruments	384–87	(D)	(D)	(D)	95	101	87	(D)	78	92	118	102
Other manufacturing industries	27,31,39	(D)	2	(D)	(D)	(D)	(D)	(D)	61	(D)	(D)	(D)
Nonmanufacturing 1/		2,313	2,706	2,700	3,256	3,729	4,442	5,505	5,570	6,140	5,090	4,620
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	252
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	93
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Trade	50–59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Services	701,72,73,75–81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4,270
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	612
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	514
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Other health services	802–805,808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3,650
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,883
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)

See explanatory information and SOURCE at end of table.

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
		[Dollars in millions]										
Distribution by industry:												
Other services	701,72,75–79,81, 83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4
Other nonmanufacturing industries	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	11
Distribution by size of company: [Number of employees]												
Total		$27,196	$27,891	$30,752	$30,343	$28,554	$28,125	$26,372	$24,722	$22,809	$22,463	$23,451
Fewer than 500		739	868	963	816	901	895	1,887	2,025	1,614	1,164	1,978
500 to 999		117	137	115	131	117	(S)	181	151	182	182	225
1,000 to 4,999		991	1,229	981	1,093	958	881	1,050	(S)	1,115	1,083	798
5,000 to 9,999		672	796	748	864	740	257	816	763	764	825	243
10,000 to 24,999		2,743	2,004	2,362	1,705	1,129	1,526	3,373	3,416	2,816	2,348	1,946 (S)
25,000 or more		21,934	23,213	25,583	25,734	24,709	24,436	19,065	17,346	16,319	16,862	18,261

1/ Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.
NA = Not available.

NOTE: As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

Table A-[illegible] Federal funds for industrial R&D performance, by industry and size of company: 1995

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Industry	SIC code	Total	Size of company: Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars in millions]					
All industries		$23,451	$1,978	$225	$798	$243	$1,946	$18,261
Manufacturing		18,831	209	100	508	104	910	17,001
Food, kindred, and tobacco products	20,21	0	0	0	0	0	0	0
Textiles and apparel	22,23	(D)	(D)	0	0	0	0	0
Lumber, wood products, and furniture	24,25	(D)	(D)	0	0	0	0	0
Paper and allied products	26	(D)	0	0	(D)	0	0	(D)
Chemicals and allied products	28	210 (S)	18	0	11	(D)	172 (S)	(D)
Industrial chemicals	281–82,286	(D)	0	0	(D)	(D)	(D)	(D)
Drugs and medicines	283	14	(D)	0	(D)	(D)	(D)	(D)
Other chemicals	284–85,287–89	(D)	(D)	0	0	0	0	0
Petroleum refining and extraction	13,29	6	0	0	0	0	(D)	(D)
Rubber products	30	(D)	0	0	0	(D)	(D)	0
Stone, clay, and glass products	32	6	(D)	(D)	(D)	(D)	0	0
Primary metals	33	13	(D)	(D)	(D)	(D)	(D)	(D)
Ferrous metals and products	331–32,3398–99	(D)	0	0	0	(D)	(D)	0
Nonferrous metals and products	3	(D)	(D)	(D)	(D)	0	(D)	(D)
Fabricated metal products	34	86	6	(D)	0	(D)	(D)	0
Machinery	35	(D)	11	(D)	(D)	(D)	38	(D)
Office, computing, and accounting machines	357	(D)	(D)	(D)	(D)	(D)	0	(D)
Other machinery, except electrical	351–56,358–59	64	(D)	(D)	(D)	(D)	38	(D)
Electrical equipment	36	1,690	77	(D)	28	(D)	0	1,563
Radio and TV receiving equipment	365	(D)	0	0	(D)	0	0	0
Communication equipment	366	(D)	45	(D)	(D)	0	0	(D)
Electronic components	367	(D)	28	10	(D)	(D)	0	(D)
Other electrical equipment	361–64,369	(D)	4	(D)	0	(D)	0	(D)
Transportation equipment	37	13,130	(D)	(D)	(D)	26	(D)	12,579
Motor vehicles and motor vehicles equipment	371	(D)	0	0	0	0	0	(D)

See explanatory information and SOURCE at end of table.

Table A-14. Federal funds for industrial R&D performance, by industry and size of company: 1995

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Industry	SIC code	Total	Size of company: Fewer than 500 employees	Size of company: 500 to 999 employees	Size of company: 1,000 to 4,999 employees	Size of company: 5,000 to 9,999 employees	Size of company: 10,000 to 24,999 employees	Size of company: 25,000 or more employees
			[Dollars in millions]					
Other transportation equipment	373–75,379	(D)	0	0	0	0	(D)	(D)
Aircraft and missiles	372,376	11,462	(D)	(D)	(D)	$26	(D)	$11,088
Professional and scientific instruments	38	3,460 (S)	$85	$68	(D)	(D)	(D)	2,779 (S)
Scientific and mechanical measuring instruments	381–82	3,358 (S)	72	(D)	(D)	(D)	(D)	(D)
Optical, surgical, photographic, and other instruments	384–87	102	14	(D)	(D)	(D)	0	(D)
Other manufacturing industries	27,31,39	(D)	(D)	0	0	0	(D)	0
Nonmanufacturing		$4,620	1,769	125	290	(D)	(D)	1,261
Transportation and utilities	40–42,44–49	252	0	0	(D)	(D)	$20	(D)
Communications	48	(D)	0	0	0	0	0	(D)
Telephone communications	481	(D)	0	0	0	0	0	(D)
Other communications	482–484,489	0	0	0	0	0	0	0
Electric, gas, and sanitary services	49	93	0	0	(D)	(D)	20	(D)
Other transportation and utilities	40–42,44–47	(D)	0	0	(D)	0	0	0
Trade	50–59	(D)	0	(D)	0	0	0	(D)
Finance, insurance, and real estate	60–65,67	(D)	0	(D)	(D)	0	0	0
Services	701,72,73,75–81,83,84,87,89	4,270	(D)	112	259	(D)	(D)	(D)
Business services	73	612	508	(D)	(D)	0	0	(D)
Computer and data processing services	737	514	(D)	(D)	(D)	0	0	(D)
Other business services	731–736,738	98	(D)	(D)	0	0	0	0
Health services	80	4	(D)	0	(D)	0	(D)	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	(D)	(D)	0	0	0	(D)	(D)
Other health services	802–805,808–809	(D)	(D)	0	(D)	0	0	0

See explanatory information and SOURCE at end of table.

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Industry	SIC code	Total	Size of company: Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars in millions]					
Engineering and management services...	87	3,650	1,250	90	(D)	(D)	(D)	(D)
Engineering, architectural, and surveying...	871	1,883	632	(D)	72	(D)	(D)	(D)
Research, development, and testing...	873	(D)	(D)	(D)	(D)	0	(D)	0
Other engineering and management services...	872,874	(D)	(D)	0	0	0	0	0
Other services...	701,72,75–79, 81,83,84,89	4	(D)	0	(D)	0	0	0
Other nonmanufacturing industries ...	07–12,14,15, 161–162,17	11	(D)	0	0	(D)	0	0

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible]

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Industry	SIC code	1974	1975	1976	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	
		[Dollars in millions]													
All agencies		$8,220	$8,605	$9,561	$10,485	$12,518	$16,382	$20,680	$27,196	$30,752	$28,554	$26,372	$22,809	$23,451	
Chemicals and allied products	28	214	236	266	295	346	421	393	230	190	126	209	(D)	210	(S)
Machinery	35	511	509	532	477	335	694	1,116	1,495	(D)	(D)	1,055	88	(D)	
Electrical equipment	36	2,307	2,307	2,555	2,648	3,309	3,920	4,523	5,161	5,399	3,743	4,550	1,402	1,690	
Motor vehicles and other transportation equipment	371,373–75,379	335	365	(T)	(T)	(T)	(T)	(T)	(T)	(D)	(D)	(D)	(D)	(D)	
Aircraft and missiles	372,376	4,003	4,434	4,930	5,486	5,840	8,528	11,396	16,582	18,519	16,828	11,096	9,369	11,462	
Other industries	–	850	754	(T)	(T)	(T)	(T)	(T)	(T)	(T)	(T)	(D)	9,491	8,333	
DOD 1/															
Total		5,919	5,812	6,222	6,950	7,939	10,540	14,571	20,948	22,252	(S)	(S)	15,044	13,876	
Chemicals and allied products	28	39	27	28	32	36	40	48	(S)	(D)	(S)	(D)	(D)	139	
Machinery	35	426	405	442	395	541	599	963	1,287	(D)	(D)	748	58	47	
Electrical equipment	36	1,643	1,570	1,607	1,692	1,920	2,338	3,057	3,812	(S)	2,229	(S)	(D)	1,442	(S)
Motor vehicles and other transportation equipment	371,373–75,379	251	288	337	382	(T)	(T)	(T)	(D)	(D)	(D)	(D)	888	1,199	
Aircraft and missiles	372,376	2,992	3,120	3,408	3,900	4,210	6,121	8,888	13,918	13,717	(S)	(S)	6,373	6,631	(S)
Other industries	–	568	402	400	461	(T)	(T)	(T)	(D)	(D)	(D)	(D)	5,707	4,418	
NASA 1/															
Total		1,095	1,409	1,604	1,697	1,786	2,306	2,150	(S)	2,805	(S)	(S)	436	2,054	
Chemicals and allied products	28	(T)	(T)	(T)	(T)	(T)	(T)	(T)	(S)	(D)	0	(S)	2	4	
Machinery	35	63	[illegible]	62	54	74	81	(T)	(D)	(D)	(D)	(D)	(D)	2	
Electrical equipment	36	162	186	200	208	252	317	188	90	115	(D)	(S)	(D)	(D)	
Motor vehicles and other transportation equipment	371,373–75,379	25	27	(T)	(T)	(T)	(T)	(T)	(T)	(D)	(D)	(D)	20	(D)	
Aircraft and missiles	372,376	789	1,082	1,267	1,348	1,221	1,785	1,959	(S)	2,650	(S)	(S)	236	985	(S)
Other industries	–	(1)	(1)	45	44	119	70	(T)	(D)	(D)	(D)	(D)	137	946	
DOE															
Total		2/	2/	2/	2/	1,575	1,976	1,949	2,901	2,968	3,221	(S)	2,961	3,547	
Chemicals and allied products	28	2/	2/	2/	2/	(T)	(T)	(T)	(S)	171	(S)	(S)	(D)	40	
Machinery	35	2/	2/	2/	2/	(T)	(T)	(T)	(S)	(D)	(S)	(D)	(S)	31	
Electrical equipment	36	2/	2/	2/	2/	784	951	917	1,188	1,184	1,353	(S)	57	72	

See explanatory information and SOURCE at end of table.

[illegible] for industrial R&D performance, by agency, and selected industry, in selected years: 1974–95

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Industry	SIC code	1974	1975	1976	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995
		[Dollars in millions]												
Motor vehicles and other transportation equipment	371,373–75,379	2/	2/	2/	2/	$16	$20	(T)	(T)	(D)	(D)	(D)	(D)	$0
Aircraft and missiles	372,376	2/	2/	2/	2/	253	340	$207	$468	$688	(S)	(S)	(S)	2,498
Other industries	--	2/	2/	2/	2/	287	356	(T)	(T)	(D)	(D)	(D)	1,197	906

1/ For 1974, funds were based on approximately 175 companies leading in Federal R&D funds; 1975–95 funds are based on all companies reporting Federal R&D funds.

2/ Data was not tabulated for this agency prior to 1979.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.
(T) = Not separately available but included in total.

NOTES: Data for DOD, NASA, and DOE do not sum to the totals because the data reported by all other Federal agencies are not tabulated. In addition, Federal R&D data collected with each annual sample (on form RD-1A) is not allocated by agency type.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible]

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Industry	SIC code	Total		Size of company											
				Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal
All Industries		33,314	2,117	30,284	1,925	1,235	44	1,217	50	274	22	172	32	131	43
Manufacturing		17,537	503	15,400	379	794	19	955	29	179	17	131	25	78	34
Food, kindred, and tobacco products	20,21	780	0	629	0	45	0	72	0	12	0	12	0	10	0
Textiles and apparel	22,23	623	1	527	1	41	0	38	0	6	0	9	0	2	0
Lumber, wood products, and furniture	24,25	690	1	610	1	31	0	40	0	7	0	1	0	1	0
Paper and allied products	26	239	3	160	0	17	0	41	1	7	0	9	0	6	2
Chemicals and allied products	28	1,600	124	1,386	104	59	0	89	7	39	3	19	7	8	3
Industrial chemicals	281–82,286	386	14	304	0	36	0	29	4	5	2	9	6	3	2
Drugs and medicines	283	339	28	288	22	10	0	26	3	3	1	8	1	4	1
Other chemicals	284–85,287–89	875	82	794	82	13	0	34	0	31	0	2	0	1	0
Petroleum refining and extraction	13,29	54	3	28	0	1	0	10	0	2	0	9	2	4	1
Rubber products	30	920	3	769	0	75	0	61	0	8	1	4	2	2	0
Stone, clay, and glass products	32	399	6	344	2	26	1	22	2	3	1	4	0	0	0
Primary metals	33	258	15	150	7	36	2	50	2	14	1	5	2	3	1
Ferrous metals and products	331–32,3398–99	73	2	17	0	11	0	30	0	12	1	2	1	1	0
Nonferrous metals and products	333–36	185	13	132	7	25	2	20	2	2	0	3	1	2	1
Fabricated metal products	34	1,392	13	1,233	6	68	1	69	0	8	2	14	4	0	0
Machinery	35	3,937	22	3,613	9	131	2	150	3	22	2	15	4	6	2
Office, computing, and accounting machines	357	426	6	377	2	15	1	25	1	6	1	2	0	1	1
Other machinery, except electrical	351–56,358–59	3,511	16	3,236	7	116	1	125	2	16	1	13	4	5	1
Electrical equipment	36	2,475	51	2,195	31	111	7	133	5	15	2	9	0	12	6
Radio and TV receiving equipment	365	84	1	75	0	3	0	6	1	0	0	0	0	0	0
Communication equipment	366	46[illegible]	10	404	7	32	1	24	1	2	0	2	0	2	1
Electronic components	357	893	27	786	18	39	3	56	3	7	1	2	0	3	1
Other electrical equipment	361–64,369	1,032	13	930	5	37	3	47	0	6	1	5	0	7	4

See explanatory information and SOURCE at end of table.

[illegible] Number of R&D-performing companies reporting Federal R&D funds and total number of R&D-performing companies, by industry and size of company: 1995

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Industry	SIC code	Total		Size of company											
				Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal
Transportation equipment	37	599	23	462	1	35	1	63	2	15	3	9	2	15	14
Motor vehicles and motor vehicles equipment	371	483	3	390	0	29	0	46	0	9	0	5	0	4	3
Other transportation equipment	373–75,379	31	3	14	0	3	0	9	0	0	0	3	1	2	2
Aircraft and missiles	372,376	85	17	58	1	3	1	8	2	6	3	1	1	9	9
Professional and scientific instruments	38	2,663	237	2,489	217	89	5	68	7	9	2	2	1	6	5
Scientific and mechanical measuring instruments	381–82	1,731	224	1,667	208	33	4	23	6	3	1	1	1	4	4
Optical, surgical, photographic, and other instruments	384–87	933	13	823	9	56	1	45	1	6	1	1	0	2	1
Other manufacturing industries	27,31,39	908	2	805	1	30	0	48	0	11	0	10	1	3	0
Nonmanufacturing		15,777	1,613	14,884	1,546	441	25	262	21	95	5	41	7	53	9
Transportation and utilities	40–42,44–49	249	13	123	0	2	0	70	4	18	1	15	4	21	4
Communications	48	99	3	58	0	2	0	27	0	1	0	0	0	11	3
Telephone communications	481	63	3	25	0	0	0	25	0	1	0	0	0	11	3
Other communications	482–484,489	37	0	32	0	2	0	2	0	0	0	0	0	0	0
Electric, gas, and sanitary services	49	132	9	64	0	0	0	38	3	16	1	13	4	2	1
Other transportation and utilities	40–42,44–47	18	1	2	0	0	0	5	1	1	0	2	0	8	0
Trade	50–59	5,727	4	5,593	0	22	2	52	0	40	0	5	0	15	2
Finance, insurance, and real estate	60–65,67	169	14	74	0	57	12	15	1	16	0	2	0	5	0
Services	701,72,73,75–81,83,84,87,89	8,286	1,580	8,034	1,545	100	11	109	16	17	2	16	3	10	3
Business services	73	4,266	577	4,106	565	68	3	68	8	10	0	7	0	7	1
Computer and data processing services	737	3,557	265	3,429	255	56	2	57	8	7	0	5	0	3	1
Other business services	731–736,738	709	311	677	310	12	1	11	0	3	0	2	0	4	0

See explanatory information and SOURCE at end of table.

Table A-[illegible] Number of R&D-performing companies reporting Federal R&D funds and total number of R&D-performing companies, by industry and size of company: 1995

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Industry	SIC code	Total		Size of company											
				Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal
Health services	80	1,055	6	1,036	3	6	0	9	1	0	0	3	1	1	1
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	745	4	730	2	6	0	5	0	0	0	2	1	1	1
Other health services	802–805, 808–809	310	2	306	1	0	0	3	1	0	0	1	0	0	0
Engineering and management services	87	2,666	992	2,613	973	22	8	24	6	3	2	3	2	1	1
Engineering, architectural, and surveying	871	1,052	410	1,013	396	15	5	20	5	2	2	1	1	1	1
Research, development, and testing	873	1,333	581	1,324	576	6	3	2	1	0	0	1	1	0	0
Other engineering and management services	872,874	281	1	276	1	1	0	2	0	1	0	1	0	0	0
Other services	701,72,75–81, 83,84,89	300	5	279	4	4	0	8	1	4	0	3	0	1	0
Other nonmanufacturing industries	07–12,14,15, 161–162,17	1,344	3	1,059	1	259	0	16	0	5	2	3	0	2	0

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

Industry-administered federally funded R&D centers (FFRDCs): funds by character of work, full-time-equivalent (FTE) R&D scientists and engineers, and total number of employees: 1986-95

Item	1986	1987	1988	1989	1990	1991	1992	1993 3/	1994	1995
	[Dollars in millions]									
Total R&D funds	$1,891	$1,995	$2,122	$2,195	$2,323	$2,277	$2,353	$1,965	$2,202	$2,273
Basic research	117	142	337	398	499	461	474	492	503	530
Applied research	629	623	371	374	386	433	507	435	503	535
Development	1,145	1,230	1,414	1,423	1,438	1,383	1,373	1,039	1,196	1,209
	[Employment]									
Number of FTE R&D scientists and engineers 1/	7,432	8,432	10,994	11,618	12,438	11,977	11,770	8,083	8,362	9,033
Total employment 2/	24,156	33,804	36,143	35,716	42,153	39,697	40,755	23,930	23,905	24,031

1/ These data were recorded in January of the year following that listed.

2/ These data were recorded in March of the year listed.

3/ The number of industry-administered FFRDCs remained the same in 1993 compared with 1992, however the levels of R&D performed and employment decreased because of changes in contract requirements and funding.

NOTE: Industry-administered federally funded research and development centers (FFRDCs) conduct R&D almost exclusively for use by the Federal Government. Data for these FFRDCs administered by industry are included in Federal R&D support shown in other tables under the industry classifications of the administering firms. See section C for a listing of industry-administered FFRDCs and their locations.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible]

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Size of company [Number of employees]	Total	Manufacturing	Nonmanufacturing
Total	33,314	17,537	15,777
Fewer than 500	30,284	15,400	14,884
500 to 999	1,235	794	441
1,000 to 4,999	1,217	955	262
5,000 to 9,999	274	179	95
10,000 to 24,999	172	131	41
25,000 or more	131	78	53

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible] of total, Federal, and company and other R&D funds and net sales of [illegible] companies, by size of R&D program: 1985-95

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Companies ranked by size of R&D program	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
	Percent of total (company, Federal, and other) R&D funds										
First 4 (1-4)	18	19	19	18	19	18	16	15	17	16	16
Next 4 (5-8)	12	11	12	12	13	13	8	8	7	9	8
Next 12 (9-20)	17	14	16	17	16	15	12	13	13	14	13
Next 20 (21-40)	13	13	12	12	12	12	11	11	12	12	12
Next 60 (41-100)	16	15	14	15	15	16	15	15	16	14	14
Next 100 (101-200)	9	10	8	8	8	9	12	12	8	9	8
Next 200 (201-400)	5	8	6	7	6	7	6	6	7	7	7
	Percent of Federal R&D funds										
First 4 (1-4)	29	30	31	31	36	38	14	11	23	31	35
Next 4 (5-8)	15	16	18	18	15	16	21	18	17	20	19
Next 12 (9-20)	27	28	27	27	30	26	21	27	32	31	27
Next 20 (21-40)	16	15	15	15	11	12	15	13	16	10	8
Next 60 (41-100)	7	7	7	6	6	6	13	11	5	6	5
Next 100 (101-200)	2	2	1	3	1	1	3	4	5	1	3
Next 200 (201-400)	0	1	0	0	0	0	2	2	2	1	3
	Percent of company and other (except Federal) R&D funds										
First 4 (1-4)	23	20	20	21	22	21	17	17	17	17	16
Next 4 (5-8)	7	7	7	7	7	7	7	8	7	7	7
Next 12 (9-20)	12	12	12	12	13	12	10	12	12	11	11
Next 20 (21-40)	12	10	11	12	12	13	10	11	11	11	11
Next 60 (41-100)	18	16	16	16	16	17	16	17	14	14	14
Next 100 (101-200)	10	10	10	10	10	10	15	14	9	9	9
Next 200 (201-400)	7	8	8	8	8	8	7	7	8	8	8
	Percent of net sales ranked by size of total R&D funds										
First 4 (1-4)	8	8	7	7	6	8	7	8	8	8	8
Next 4 (5-8)	4	5	5	5	5	4	3	3	3	2	2
Next 12 (9-20)	5	5	5	5	5	5	4	4	4	5	6
Next 20 (21-40)	8	7	7	6	5	5	4	4	4	4	4
Next 60 (41-100)	12	10	11	11	12	12	12	12	11	10	9
Next 100 (101-200)	13	10	8	9	8	9	9	9	8	8	8
Next 200 (201-400)	15	9	12	10	11	12	11	11	10	10	10

NOTES: Companies were ranked individually for each year; therefore, particular companies comprising the size groups may have changed from year to year.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

Table A-[illegible]. Domestic net sales of R&D-performing companies, by industry and size of company: 1994–95

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Industry	SIC code	Total	Size of company: Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars in millions]					
		1994						
All industries		$3,595,278	$343,987	$116,833	$582,384	$400,872	$706,139	$1,445,062
Manufacturing		2,523,767	251,275	94,068	424,581	267,088	504,050	982,703
Food, kindred, and tobacco products	20,21	302,528	12,427	12,160	57,680	33,830	50,250	136,182
Textiles and apparel	22,23	50,284	4,717	(D)	14,704	4,073	16,779	(D)
Lumber, wood products, and furniture	24,25	32,193	4,914	2,415	10,781	7,403	(D)	(D)
Paper and allied products	26	130,358	16,808	1,347	15,372	14,387	36,193	46,252
Chemicals and allied products	28	322,039	29,423	9,511	52,769	39,391	93,368	97,576
Industrial chemicals	281–82,286	143,233	16,804	5,885	18,970	11,137	39,004	51,432
Drugs and medicines	283	94,328	3,444	(D)	15,713	10,589	32,310	(D)
Other chemicals	284–85,287–89	84,477	9,176	(D)	18,086	17,664	22,055	(D)
Petroleum refining and extraction	13,29	235,280	1,838	1,065	24,744	11,582	89,211	106,840
Rubber products	30	62,223	19,289	3,553	16,366	6,213	(D)	(D)
Stone, clay, and glass products	32	35,778	3,319	(D)	6,620	5,179	14,307	(D)
Primary metals	33	116,624	7,668	8,839	22,381	30,748	18,662	28,326
Ferrous metals and products	331–32,3398–99	69,915	5,058	1,793	13,679	21,328	(D)	(D)
Nonferrous metals and products	333–36	46,710	2,611	7,046	8,702	9,420	(D)	(D)
Fabricated metal products	34	91,075	25,945	(D)	27,036	6,996	23,626	(D)
Machinery	35	210,835	58,946	16,328	52,135	29,452	(D)	(D)
Office, computing, and accounting machines	357	51,709	9,123	3,072	17,521	10,489	(D)	(D)
Other machinery, except electrical	351–56,358–59	159,126	49,823	13,256	34,614	18,964	(D)	(D)
Electrical equipment	36	259,693	30,526	11,677	42,493	18,894	41,687	114,417
Radio and TV receiving equipment	365	6,650	1,678	945	4,028	0	0	0
Communication equipment	366	48,152	6,490	1,948	10,366	(D)	(D)	(D)
Electronic components	367	80,312	11,852	4,472	15,803	(D)	(D)	(D)
Other electrical equipment	361–64,369	124,579	10,505	4,312	12,296	5,110	21,986	70,370
Transportation equipment	37	477,508	6,558	6,610	46,686	36,476	44,139	337,038
Motor vehicles and motor vehicles equipment	371	350,952	2,989	5,376	36,662	(D)	(D)	(D)

See explanatory information and SOURCE at end of table.

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Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars in millions]					
		1994						
Other transportation equipment	373–75,379	$23,431	$2,488	$867	$4,676	(D)	(D)	(D)
Aircraft and missiles	372,376	103,125	1,081	367	5,348	$4,729	$8,176	$83,424
Professional and scientific instruments	38	124,541	19,365	7,270	19,472	9,331	5,607	63,496
Scientific and mechanical measuring instruments	381–82	63,419	6,698	(D)	6,748	4,331	(D)	36,953
Optical, surgical, photographic, and other instruments	384–87	61,121	12,667	(D)	12,724	5,000	(D)	26,543
Other manufacturing industries	27,31,39	72,809	9,534	(D)	15,343	13,132	24,074	(D)
Nonmanufacturing 1/		1,071,511	92,712	22,765	157,803	133,784	202,089	462,359
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA
Communications	48	NA	NA	NA	NA	NA	NA	NA
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA
Trade	50–59	NA	NA	NA	NA	NA	NA	NA
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA
Services	701,72,73,75–81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA
Business services	73	NA	NA	NA	NA	NA	NA	NA
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA
Health services	80	NA	NA	NA	NA	NA	NA	NA
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806, 807	NA	NA	NA	NA	NA	NA	NA
Other health services	802–805,808–809	NA	NA	NA	NA	NA	NA	NA

See explanatory information and SOURCE at end of table.

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Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[Dollars in millions]						
		1994						
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA
Other services	701,72,75–79, 81,83,84,89	NA	NA	NA	NA	NA	NA	NA
Other nonmanufacturing industries	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA
		1995						
All industries		$3,921,561	$374,478	$147,062	$615,336	$466,186	$749,478	$1,569,021
Manufacturing		2,756,605	235,280	103,696	475,358	309,009	578,348	1,054,914
Food, kindred, and tobacco products	20,21	313,839	9,809	7,917	54,931	33,436	60,183	147,563
Textiles and apparel	22,23	42,477	(D)	3,904	10,816	4,714	13,677	(D)
Lumber, wood products, and furniture	24,25	31,989	(D)	3,082	11,090	6,433	(D)	(D)
Paper and allied products	26	138,086	2,128	2,552	21,231	10,398	38,581	63,196
Chemicals and allied products	28	371,302	24,525	[illegible]	64,432	88,643	95,305	84,015
Industrial chemicals	281–82,286	133,416	9,180	[illegible]	25,760	9,930	46,587	32,767
Drugs and medicines	283	97,970	3,097	1,416	17,005	4,443	(D)	(D)
Other chemicals	284–85,287–89	139,915	12,248	3,773	21,667	74,270	(D)	(D)
Petroleum refining and extraction	13,29	245,662	1,053	(D)	20,614	(D)	136,022	78,656
Rubber products	30	76,816	22,555	(D)	19,650	7,385	7,583	(D)
Stone, clay, and glass products	32	30,363	2,953	2,883	8,098	3,795	12,634	0
Primary metals	33	115,664	4,145	4,714	29,665	25,053	19,425	32,662
Ferrous metals and products	331–32,3398–99	66,175	1,102	939	14,073	(D)	(D)	(D)
Nonferrous metals and products	333–36	49,489	3,042	3,775	15,592	(D)	(D)	(D)

See explanatory information and SOURCE at end of table.

Table A-20. Domestic net sales of R&D-performing companies, by industry and size of company: 1994-95

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Industry	SIC code	Total	Size of company: Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars in millions]					
		1995						
Fabricated metal products	34	$89,012	$17,182	$7,178	$20,867	$10,304	$33,480	$0
Machinery	35	269,689	73,687	17,591	63,652	36,592	46,915	31,252
Office, computing, and accounting machines	357	57,983	4,885	3,557	18,649	13,138	(D)	(D)
Other machinery, except electrical	351–56,358–59	211,706	68,802	14,034	45,003	23,454	(D)	(D)
Electrical equipment	36	315,070	32,757	15,181	60,102	24,103	42,146	140,782
Radio and TV receiving equipment	365	6,921	1,051	782	5,088	0	0	0
Communication equipment	366	47,827	9,771	4,132	12,528	(D)	(D)	(D)
Electronic components	367	120,519	12,479	5,998	26,438	(D)	(D)	(D)
Other electrical equipment	361–64,369	139,803	9,456	4,269	16,048	7,452	16,967	85,611
Transportation equipment	37	532,826	7,430	2,889	51,802	29,267	45,941	395,497
Motor vehicles and motor vehicles equipment	371	376,945	6,336	2,143	42,788	23,508	(D)	(D)
Other transportation equipment	373–75,379	24,978	(D)	451 (S)	5,132	0	8,620	(D)
Aircraft and missiles	372,376	130,904	(D)	296	3,881	5,759	(D)	117,695
Professional and scientific instruments	38	116,696	20,099	10,402	24,918	9,897	(D)	(D)
Scientific and mechanical measuring instruments	381–82	57,720	12,513	4,030	9,395	3,020	(D)	(D)
Optical, surgical, photographic, and other instruments	384–87	58,976	7,586	6,373	15,522	6,877	(D)	(D)
Other manufacturing industries	27,31,39	67,134	9,696	2,864	13,491	(D)	19,640	11,229
Nonmanufacturing		1,164,955	139,198	43,366	139,978	157,177	171,130	514,106
Transportation and utilities	40–42,44–49	460,565	(D)	(D)	43,898	50,520	75,016	288,497
Communications	48	220,446	433	(D)	7,021	(D)	0	211,201
Telephone communications	481	218,474	(D)	0	(D)	(D)	0	211,201
Other communications	482–484,489	1,972	(D)	(D)	(D)	0	0	0
Electric, gas, and sanitary services	49	168,314	(D)	0	32,841	48,195	(D)	(D)
Other transportation and utilities	40–42,44–47	71,805	(D)	0	4,036	(D)	(D)	(D)

See explanatory information and SOURCE at end of table.

[illegible] company, 1994-95

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Industry	SIC code	Total	Size of company: Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars in millions]					
		1995						
Trade	50–59	$315,337	$43,687	$5,136	$47,538	$59,928	$24,586	$134,462
Finance, insurance, and real estate	60–65,67	105,961	(D)	14,389	11,717	24,087	(D)	(D)
Services	701,72,73,75–81, 83,84,87,89	230,175	90,519	9,968	30,488	14,721	50,754	33,725
Business services	73	91,588	20,395	7,000	21,397	8,102	18,490	16,205
Computer and data processing services	737	76,697	18,576	6,412	19,216	(D)	(D)	9,443
Other business services	731–736,738	14,891	1,819	589	2,181	(D)	(D)	6,762
Health services	80	14,480	3,097	(D)	993	0	(D)	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	13,812	2,906	(D)	572	0	(D)	(D)
Other health services	802–805,808–809	668	191	0	421 (S)	0	(D)	0
Engineering and management services	87	98,178	64,091	(D)	6,246	4,113	10,322	(D)
Engineering, architectural, and surveying	871	51,343	26,723	1,379	5,004	(D)	(D)	(D)
Research, development, and testing	873	39,209	35,844	645	(D)	0	(D)	0
Other engineering and management services	872,874	7,627	1,524	(D)	(D)	(D)	(D)	0
Other services	701,72,75–79, 81,83,84,89	25,929	2,936	442	1,852	2,506	(D)	(D)
Other nonmanufacturing industries	07–12,14,15, 161–162,17	52,917	2,349	(D)	6,337	7,921	(D)	(D)

1/ Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.
NA = Not available.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

R&D funds as a percent of net sales in R&D-performing companies, by industry and size of company: 1985–95

Page 1 of 3

Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
		[Percent]										
All industries 1/		NA	NA	NA	NA	NA	NA	NA	NA	NA	3.6%	3.6%
Distribution by industry:												
Manufacturing		4.4%	4.7%	4.6%	4.5%	4.3%	4.2%	4.2%	4.2%	3.8%	3.6	3.6
Food, kindred, and tobacco products	20,21	(D)	(D)	0.6	(D)	(D)	(D)	0.5	0.5	0.5	0.5	0.5
Textiles and apparel	22,23	(D)	(D)	(D)	(D)	(D)	(D)	(D)	0.6	(D)	(D)	(D)
Lumber, wood products, and furniture	24,25	0.8	0.6	0.6	(D)	0.6	0.6	(D)	(D)	(D)	(D)	(D)
Paper and allied products	26	(D)	(D)	(D)	(D)	0.8	1.0	1.1	(D)	(D)	(D)	(D)
Chemicals and allied products	28	5.0	5.2	5.3	5.3	5.4	5.3	5.4	5.5	(D)	(D)	4.7
Industrial chemicals	281–82,286	4.4	4.6	4.7	4.4	4.2	4.5	4.6	4.6	(D)	(D)	(D)
Drugs and medicines	283	(D)	8.5	(D)	8.8	(D)	(D)	8.9	9.6	12.5	10.2	10.4
Other chemicals	284–85,287–89	(D)	3.3	(D)	3.4	(D)	(D)	3.1	2.7	(D)	(D)	(D)
Petroleum refining and extraction	13,29	(D)	(D)	1.0	1.0	0.9	0.9	1.0	0.9	0.9	0.8	0.7
Rubber products	30	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Stone, clay, and glass products	32	(D)	2.5	2.6	(D)	(D)	(D)	(D)	(D)	1.5	1.7	1.5
Primary metals	33	(D)	(D)	0.9	0.8	0.8	0.8	0.8	0.6	0.7	0.6	0.5
Ferrous metals and products	331–32,3398–99	(D)	(D)	(D)	0.5	(D)	(D)	(D)	(D)	0.5	(D)	(D)
Nonferrous metals and products	333–36	1.4	1.5	(D)	1.0	(D)	(D)	(D)	(D)	1.2	(D)	(D)
Fabricated metal products	34	1.5	1.5	1.5	1.3	1.5	1.4	1.5	1.5	1.4	1.2	1.1
Machinery	35	7.6	(D)	(D)	7.7	7.9	7.7	8.1	7.8	4.6	3.8	(D)
Office, computing, and accounting machines	357	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	9.9	7.9	(D)
Other machinery, except electrical	351–56,358–59	(D)	3.0	3.0	2.9	(D)	(D)	(D)	(D)	2.6	2.5	2.4
Electrical equipment	36	7.6	7.9	8.2	7.5	7.3	6.5	6.5	5.6	6.2	5.9	6.0
Radio and TV receiving equipment	365	(D)	3.6	3.2	2.4	1.8	1.6	(D)	(D)	(D)	(D)	(D)
Communication equipment	366	10.1	9.9	10.2	10.7	11.6	10.0	(D)	(D)	(D)	(D)	(D)
Electronic components	367	9.6	(D)	10.0	9.0	(D)	8.3	7.9	7.5	8.1	7.5	(D)
Other electrical equipment	361–64,369	(D)	(D)	2.7	2.5	(D)	3.7	(D)	(D)	(D)	(D)	(D)
Transportation equipment	37	(D)	8.3	8.7	8.9	8.1	7.5	7.3	7.1	6.4	5.9	6.1
Motor vehicles and motor vehicles equipment	371	3.8	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Other transportation equipment	373–75,379	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Aircraft and missiles	372,376	14.9	13.4	14.7	16.3	13.5	11.8	12.1	11.8	12.5	13.8	12.9

See explanatory information and SOURCE at end of table.

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[illegible] R&D-performing companies, by industry and size of company: 1985-95

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
		[Percent]										
Distribution by industry:												
Professional and scientific instruments	38	8.9%	8.8%	7.9%	7.4%	7.2%	8.0%	9.1%	9.4%	9.7%	9.2%	10.3%
Scientific and mechanical measuring instruments	381–82	(D)	(D)	(D)	7.9	7.4	8.6	10.0	10.6	11.5	11.0	12.4
Optical, surgical, photographic, and other instruments	384–87	(D)	(D)	(D)	7.3	7.3	7.7	8.1	8.3	8.1	7.3	8.2
Other manufacturing industries	27,31,39	(D)	1.2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Nonmanufacturing 1/		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.7
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.0
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.3
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Trade	50–59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Services	701,72,73,75–81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.8
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10.1
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	11.8
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.6
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.2
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Other health services	802–805,808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Other services	701,72,75–79,81, 83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.6

See explanatory information and SOURCE at end of table.

Table A-[illegible]. Total (company, Federal, and other) R&D funds as a percent of net sales in R&D-performing companies, by industry and size of company: 1985–95

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
		[Percent]										
Distribution by industry:												
Other nonmanufacturing industries	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.0%
Distribution by size of company: [Number of employees]												
Total 1/		NA	NA	NA	NA	NA	NA	NA	NA	NA	3.6%	3.4
Fewer than 500		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.6	4.4
500 to 999		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.6	3.2
1,000 to 4,999		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.6	3.0
5,000 to 9,999		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.2	2.0
10,000 to 24,999		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.7	2.3
25,000 or more		NA	NA	NA	NA	NA	NA	NA	NA	NA	5.2	4.3

1/ Beginning in 1995 this table includes both manufacturing and nonmanufacturing companies. Only manufacturing companies were included in prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
NA = Not available.

NOTE: As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible]

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
		[Percent]										
All Industries 1/		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.9%	2.8%
Distribution by industry:												
Manufacturing		3.0%	3.2%	3.1%	3.1%	3.1%	3.1%	3.2%	3.3%	3.1%	2.9	2.9
Food, kindred, and tobacco products	20,21	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Textiles and apparel	22,23	0.5	0.5	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.9
Lumber, wood products, and furniture	24,25	0.8	0.6	0.6	0.6	0.6	0.6	0.9	0.9	0.7	0.6	0.7
Paper and allied products	26	0.8	0.7	0.6	0.8	0.8	1.0	1.1	1.0	1.1	1.0	1.0
Chemicals and allied products	28	4.9	5.1	5.2	5.2	5.4	5.3	5.3	5.4	6.0	5.1	4.7
Industrial chemicals	281–82,286	4.2	4.4	4.4	4.2	4.1	4.4	4.4	4.4	4.4	3.3	3.9
Drugs and medicines	283	8.0	8.4	8.7	8.8	8.9	8.8	8.9	9.6	12.5	10.2	10.4
Other chemicals	284–85,287–89	3.1	3.3	3.3	3.4	3.9	3.4	3.0	2.7	2.7	2.5	1.4
Petroleum refining and extraction	13,29	0.9	1.1	1.0	1.0	0.9	0.9	1.0	0.9	0.9	0.8	0.7
Rubber products	30	1.8	1.7	1.6	1.7	1.9	2.1	2.3	2.3	2.1	2.3	1.6
Stone, clay, and glass products	32	2.3	2.4	2.5	2.0	1.8	1.7	1.6	1.6	1.5	1.5	1.5
Primary metals	33	0.9	1.0	0.9	0.7	0.7	0.8	0.8	0.6	0.7	0.6	0.5
Ferrous metals and products	331–32,3398–99	0.5	0.7	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3
Nonferrous metals and products	333–36	1.4	1.5	1.3	1.0	1.0	1.2	1.2	0.7	1.2	0.9	0.7
Fabricated metal products	34	1.4	1.4	1.2	1.1	1.2	1.1	1.2	1.1	1.1	1.0	1.1
Machinery	35	6.7	7.3	7.1	6.8	7.3	7.2	7.5	7.3	4.5	3.8	3.6
Office, computing, and accounting machines	357	12.4	12.4	12.3	11.2	13.1	14.4	14.9	13.7	9.8	7.9	8.1
Other machinery, except electrical	351–56,358–59	2.6	2.9	3.0	2.8	2.6	2.3	2.9	2.9	2.5	2.5	2.4
Electrical equipment	36	4.8	5.1	5.4	5.3	5.2	4.5	4.3	4.0	5.4	5.2	5.4
Radio and TV receiving equipment	365	4.3	3.6	3.2	2.4	1.8	1.6	1.0	0.6	4.0	1.0	1.6
Communication equipment	366	5.4	5.2	5.5	6.1	6.8	6.1	(S)	7.0	10.1	10.3	8.0
Electronic components	367	8.2	9.2	8.5	8.0	7.7	7.4	7.2	7.0	7.8	7.3	8.0
Other electrical equipment	361–64,369	2.0	2.2	2.6	2.3	2.3	2.2	2.2	2.1	2.3	2.1	2.5
Transportation equipment	37	3.4	3.6	3.4	3.5	3.5	3.4	4.0	4.2	3.9	3.7	3.6
Motor vehicles and motor vehicles equipment	371	3.1	3.3	3.4	3.4	3.7	3.7	4.1	4.0	3.7	3.4	3.6

See explanatory information and SOURCE at end of table.

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
		[Percent]										
Distribution by industry:												
Other transportation equipment	373–75,379	2.3%	2.7%	2.5%	2.6%	2.5%	2.1%	2.1%	2.1%	1.9%	1.2%	0.9%
Aircraft and missiles	372,376	3.9	4.0	3.6	3.9	3.3	3.1	4.0	4.7	4.7	5.3	4.2
Professional and scientific instruments	38	8.3	8.2	7.5	7.1	6.8	7.1	7.1	7.2	7.2	6.5	7.3
Scientific and mechanical measuring instruments	381–82	8.4	8.4	8.1	7.6	6.9	6.9	6.3	6.2	6.4	5.8	6.6
Optical, surgical, photographic, and other instruments	384–87	8.1	8.0	7.2	7.1	7.1	7.5	8.0	8.2	7.9	7.2	8.0
Other manufacturing industries	27,31,39	1.0	1.2	1.1	1.0	0.9	0.9	0.8	1.3	1.3	1.1	1.2
Nonmanufacturing 1/		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.4
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.2
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.1
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.0
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.2
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.1
Trade	50–59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.4
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.7
Services	701,72,73,75–81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.9
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.5
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	11.1
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.9
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.2
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.3
Other health services	802–805,808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.4 (S)

See explanatory information and SOURCE at end of table.

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
		[Percent]										
Distribution by industry:												
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.1%
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.0
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.2
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.7
Other services	701,72,75–79,81, 83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.6
Other nonmanufacturing industries	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.8
Distribution by size of company:												
[Number of employees]												
Total 1/		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.9%	2.8
Fewer than 500		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.5	3.9
500 to 999		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.5	3.0
1,000 to 4,999		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.5	2.6
5,000 to 9,999		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.2	2.0
10,000 to 24,999		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.5	2.0
25,000 or more		NA	NA	NA	NA	NA	NA	NA	NA	NA	3.6	3.1

1/ Beginning in 1995 this table includes both manufacturing and nonmanufacturing companies. Only manufacturing companies were included in prior years.

KEY: (S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.
NA = Not available.

NOTE: As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

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Industry	SIC code	Total R&D funds as a percent of net sales: First 4 companies	Next 4 companies	Next 12 companies	Total R&D funds: First 4 companies	Next 4 companies	Next 12 companies
		[Percent]			[Dollars in millions]		
All Industries		6.8%	12.4%	8.1%	$20,734	$10,350	$17,620
Manufacturing		8.1	12.6	8.0	19,970	8,234	15,703
Food, kindred, and tobacco products	20,21	1.1	0.4	0.3	611	199	269
Textiles and apparel	22,23	2.2	1.3	0.6	110	56	71
Lumber, wood products, and furniture	24,25	0.8	1.1	0.9	73	42	33
Paper and allied products	26	2.3	1.0	0.4	980 (S)	151	150
Chemicals and allied products	28	9.1	6.8	8.9	3,751	2,753	4,820
Industrial chemicals	281–82,286	5.9	7.3	3.8	2,579	825	1,123
Drugs and medicines	283	11.2	8.9	13.5	3,592	2,277	3,128
Other chemicals	284–85,287–89	3.5	2.1	1.7	1,026	180	310
Petroleum refining and extraction	13,29	1.1	0.9	0.3	1,028	474	222
Rubber products	30	3.5	2.6	2.4	502	158	181
Stone, clay, and glass products	32	2.0	2.4	1.2	231	89	60
Primary metals	33	0.6	0.9	0.4	226	82	120
Ferrous metals and products	331–32,3398–99	0.3	0.4	0.8	85	46	61
Nonferrous metals and products	333–36	1.4	0.4	0.7	217	51	47
Fabricated metal products	34	3.7	1.3	0.8	269	133	161
Machinery	35	8.0	9.0	6.8	2,100	1,124	1,911
Office, computing, and accounting machines	357	12.6	6.8	13.7	1,878	917	1,119
Other machinery, except electrical	351–56,358–59	5.2	3.4	3.4	1,329	438	643
Electrical equipment	36	7.4	13.7	6.0	7,782	2,508	2,159
Radio and TV receiving equipment	365	1.6	3.9	1.6	74	15	17
Communication equipment	366	13.0	8.1	8.9	2,280	487	586
Electronic components	367	12.4	5.4	10.9	6,546	824	1,060
Other electrical equipment	361–64,369	3.3	2.3	1.9	2,280	410	355

See explanatory information and SOURCE at end of table.

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Industry	SIC code	Total R&D funds as a percent of net sales			Total R&D funds		
		First 4 companies	Next 4 companies	Next 12 companies	First 4 companies	Next 4 companies	Next 12 companies
			[Percent]		[Dollars in millions]		
Transportation equipment	37	7.9%	6.9%	7.4%	$19,731	$6,241	$5,450
Motor vehicles and motor vehicles equipment	371	5.1	1.9	1.1	14,228	266	219
Other transportation equipment	373–75,379	3.2	1.2	0.5	486	52	25
Aircraft and missiles	372,376	14.9	12.7	8.3	10,308	5,105	1,477
Professional and scientific instruments	38	15.2	9.4	12.0	5,352	1,481	1,421
Scientific and mechanical measuring instruments	381–82	20.8	6.6	12.1	4,238	797	557
Optical, surgical, photographic, and other instruments	384–87	10.5	8.5	8.9	2,513	395	592
Other manufacturing industries	27,31,39	3.7	2.5	0.6	273	109	138
Nonmanufacturing		7.7	12.6	0.1	8,847	3,436	3,455
Transportation and utilities	40–42,44–49	3.9	0.6	0.3	4,602	231	240
Communications	48	3.9	0.3	0.2	4,602	170	76
Telephone communications	481	3.9	0.3	0.1	4,602	170	34
Other communications	482–484,489	3.2	9.1	0.7	36	6	5
Electric, gas, and sanitary services	49	0.7	0.4	0.1	180	55	71
Other transportation and utilities	40–42,44–47	0.2	0.1	0.1	56	23	14
Trade	50–59	11.3	6.1	1.8	4,995	383	726
Finance, insurance, and real estate	60–65,67	2.7	0.9	0.3	336	108	79
Services	701,72,73,75–81, 83,84,87,89	16.3	15.9	13.0	3,894	1,468	1,643
Business services	73	17.6	14.9	24.9	2,317	861	1,028
Computer and data processing services	737	17.6	14.9	24.9	2,317	861	1,028
Other business services	731–736,738	7.7	1.5	0.6	58	29	30

See explanatory information and SOURCE at end of table.

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Industry	SIC code	Total R&D funds as a percent of net sales			Total R&D funds		
		First 4 companies	Next 4 companies	Next 12 companies	First 4 companies	Next 4 companies	Next 12 companies
		[Percent]			[Dollars in millions]		
Health services	80	5.6 %	6.3%	3.0%	(D)	$20	$24
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	5.6	4.9	3.5	(D)	19	16
Other health services	802–805,808–809	2.2	2.8	0.5	$9	3	0
Engineering and management services	87	18.2	6.6	73.0	(D)	342	552
Engineering, architectural, and surveying	871	9.2	74.3	13.1	(D)	174	257
Research, development, and testing	873	49.1	97.5	90.8	1,378 (S)	234	405
Other engineering and management services	872,874	0.6	0.1	0.6	16	5	(D)
Other services	701,72,75–79,81, 83,84,89	0.7	1.8	0.7	100	21	25
Other nonmanufacturing industries	07–12,14,15, 161–162,17	1.7	1.3	0.3	191	42	36

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

NOTE: Rankings were based on total (company, Federal, and other) R&D funds.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

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Industry	SIC code	Company and other R&D funds as a percent of net sales			Company and other R&D funds		
		First 4 companies	Next 4 companies	Next 12 companies	First 4 companies	Next 4 companies	Next 12 companies
			[Percent]			[Dollars in millions]	
All industries		5.8%	6.5%	7.4%	$17,863	$7,278	$11,970
Manufacturing		6.4	5.4	6.2	15,681	5,409	10,540
Food, kindred, and tobacco products	20,21	1.1	0.4	0.3	611	199	269
Textiles and apparel	22,23	2.2	1.3	0.6	110	56	71
Lumber, wood products, and furniture	24,25	0.8	1.1	0.9	73	42	32
Paper and allied products	26	2.2	1.0	0.4	935 (S)	151	150
Chemicals and allied products	28	9.1	6.8	8.9	3,748	2,753	4,812
Industrial chemicals	281–82,286	5.9	6.3	3.9	2,570	720	1,063
Drugs and medicines	283	11.2	8.9	13.5	3,592	2,277	3,126
Other chemicals	284–85,287–89	3.5	2.1	1.7	1,026	180	310
Petroleum refining and extraction	13,29	1.1	0.9	0.3	1,025	473	219
Rubber products	30	3.4	1.9	2.5	443	141	169
Stone, clay, and glass products	32	2.0	1.7	1.7	231	88	56
Primary metals	33	0.6	0.9	0.4	220	81	120
Ferrous metals and products	331–32,3398–99	0.3	0.4	0.9	85	46	58
Nonferrous metals and products	333–36	1.3	0.4	0.7	210	51	47
Fabricated metal products	34	2.6	1.1	0.9	242	109	141
Machinery	35	7.9	9.0	7.5	2,077	1,117	1,895
Office, computing, and accounting machines	357	12.6	6.8	13.5	1,873	917	1,109
Other machinery, except electrical	351–56,358–59	5.1	3.3	3.3	1,305	424	625
Electrical equipment	36	6.4	9.9	6.1	6,702	2,240	1,938
Radio and TV receiving equipment	365	1.5	3.9	1.6	71	15	17
Communication equipment	366	11.0	6.8	8.9	1,835	466	582
Electronic components	367	11.3	5.4	10.0	6,001	816	1,043
Other electrical equipment	361–64,369	2.5	2.3	1.9	1,732	408	355

See explanatory information and SOURCE at end of table.

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Industry	SIC code	Company and other R&D funds as a percent of net sales: First 4 companies	Next 4 companies	Next 12 companies	Company and other R&D funds: First 4 companies	Next 4 companies	Next 12 companies
		[Percent]			[Dollars in millions]		
Transportation equipment	37	5.1%	3.7%	2.4%	$14,381	$2,497	$1,538
Motor vehicles and motor vehicles equipment	371	4.7	1.9	1.1	12,893	266	219
Other transportation equipment	373–75,379	1.0	1.2	0.5	152	52	25
Aircraft and missiles	372,376	4.8	3.4	3.6	3,647	1,150	649
Professional and scientific instruments	38	10.1	6.8	9.5	3,164	875	1,027
Scientific and mechanical measuring instruments	381–82	7.7	10.6	3.4	1,587	388	404
Optical, surgical, photographic, and other instruments	384–87	10.2	10.6	7.8	2,435	394	590
Other manufacturing industries	27,31,39	3.7	2.5	0.6	272	109	138
Nonmanufacturing		7.0	8.7	7.2	8,296	2,600	2,752
Transportation and utilities	40–42,44–49	3.7	0.4	0.2	(D)	199	193
Communications	48	3.7	0.4	0.2	(D)	170	76
Telephone communications	481	3.7	0.3	0.1	(D)	170	34
Other communications	482–484,489	3.2	9.1	0.7	36	6	5
Electric, gas, and sanitary services	49	0.5	0.2	0.2	111	39	64
Other transportation and utilities	40–42,44–47	0.1	0.2	0.0	51	17	11
Trade	50–59	11.1	6.1	1.8	4,920	383	726
Finance, insurance, and real estate	60–65,67	2.7	0.9	0.3	336	108	79
Services	701,72,73,75–81, 83,84,87,89	14.7	7.5	13.2	2,417	1,158	1,407
Business services	73	17.6	14.9	23.6	2,317	861	1,011
Computer and data processing services	737	17.6	14.9	23.6	2,317	861	1,011
Other business services	731–736,738	6.3	1.0	0.6	49	27	24

See explanatory information and SOURCE at end of table.

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Industry	SIC code	Company and other R&D funds as a percent of net sales			Company and other R&D funds		
		First 4 companies	Next 4 companies	Next 12 companies	First 4 companies	Next 4 companies	Next 12 companies
			[Percent]			[Dollars in millions]	
Health services	80	5.6%	6.3%	2.9%	(D)	$20	$23
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	5.6	4.9	3.4	(D)	19	16
Other health services	802–805,808–809	2.1	1.4	2.7	$9	2	(D)
Engineering and management services	87	5.5	8.4	3.6	621	208	408
Engineering, architectural, and surveying	871	2.4	22.0	34.1	411	57	82
Research, development, and testing	873	98.4	7.9	93.5	364	193	364
Other engineering and management services	872,874	0.6	0.1	0.0	16	3	0
Other services	701,72,75–79,81, 83,84,89	0.7	1.7	0.7	100	20	23
Other nonmanufacturing industries	07–12,14,15, 161–162,17	1.7	0.8	0.3	191	39	28

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

NOTE: Rankings were based on total (company, Federal, and other) R&D funds.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible] Federal R&D funds as a percent of net sales in R&D-performing companies, by industry, by size of company, and ranked by size of federally financed R&D program: 1995

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Industry	SIC code	Federal R&D funds as a percent of net sales: First 4 companies	Federal R&D funds as a percent of net sales: Next 4 companies	Federal R&D funds as a percent of net sales: Next 12 companies	Federal R&D funds: First 4 companies	Federal R&D funds: Next 4 companies	Federal R&D funds: Next 12 companies
		[Percent]			[Dollars in millions]		
All Industries		4.8%	11.8%	4.1%	$8,182	$4,433	$6,321
Manufacturing		4.8	8.0	3.6	8,182	4,361	4,831
Food, kindred, and tobacco products	20,21	0.0	0.0	0.0	0	0	0
Textiles and apparel	22,23	11.2	0.0	0.0	(D)	0	0
Lumber, wood products, and furniture	24,25	9.7	0.0	0.0	(D)	0	0
Paper and allied products	26	0.2	0.0	0.0	(D)	0	0
Chemicals and allied products	28	1.0	0.1	0.0	171 (S)	14	10
Industrial chemicals	281–82,286	1.0	0.1	0.0	171 (S)	14	4
Drugs and medicines	283	0.1	0.0	0.0	4	2	1
Other chemicals	284–85,287–89	1.0	0.0	0.0	(D)	0	0
Petroleum refining and extraction	13,29	0.0	0.0	0.0	6	0	0
Rubber products	30	1.8	0.0	0.0	(D)	0	0
Stone, clay, and glass products	32	0.6	0.0	0.0	6	(D)	0
Primary metals	33	0.1	0.0	0.0	12	1	0
Ferrous metals and products	331–32,3398–99	0.1	0.0	0.0	(D)	0	0
Nonferrous metals and products	333–36	0.1	0.0	0.0	(D)	0	0
Fabricated metal products	34	1.0	0.1	0.7	75	8	1
Machinery	35	0.2	0.3	0.4	49	25	13
Office, computing, and accounting machines	357	0.4	0.1	0.0	23	(D)	0
Other machinery, except electrical	351–56,358–59	0.2	0.2	0.4	49	12	3
Electrical equipment	36	2.1	0.5	0.4	1,567	45	29
Radio and TV receiving equipment	365	0.6	0.0	0.0	(D)	0	0
Communication equipment	366	15.7	4.7	0.7	(D)	5	(D)
Electronic components	367	2.8	4.0	0.7	(D)	12	10
Other electrical equipment	361–64,369	0.8	0.2	0.0	(D)	3	1

See explanatory information and SOURCE at end of table.

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Industry	SIC code	Federal R&D funds as a percent of net sales			Federal R&D funds		
		First 4 companies	Next 4 companies	Next 12 companies	First 4 companies	Next 4 companies	Next 12 companies
		[Percent]			[Dollars in millions]		
Transportation equipment	37	4.5%	6.4%	1.5%	$7,670	$3,862	$1,591
Motor vehicles and motor vehicles equipment	371	0.5	0.0	0.0	(D)	0	0
Other transportation equipment	373–75,379	2.4	0.0	0.0	(D)	0	0
Aircraft and missiles	372,376	16.6	5.1	4.4	7,520	3,159	783
Professional and scientific instruments	38	13.6	2.6	5.5	2,776 (S)	510	110
Scientific and mechanical measuring instruments	381–82	13.6	4.7	2.3	2,776 (S)	459	74
Optical, surgical, photographic, and other instruments	384–87	1.0	0.4	0.1	96	6	0
Other manufacturing industries	27,31,39	0.1	0.0	0.0	(D)	0	0
Nonmanufacturing		7.1	2.7	1.0	2,225	264	408
Transportation and utilities	40–42,44–49	0.2	0.5	0.0	217	32	(D)
Communications	48	0.1	0.0	0.0	(D)	0	0
Telephone communications	481	0.1	0.0	0.0	(D)	0	0
Other communications	482–484,489	0.0	0.0	0.0	0	0	0
Electric, gas, and sanitary services	49	0.8	0.0	0.0	89	4	(D)
Other transportation and utilities	40–42,44–47	3.9	0.0	0.0	(D)	0	0
Trade	50–59	0.2	0.0	0.0	(D)	0	0
Finance, insurance, and real estate	60–65,67	0.2	0.0	0.0	(D)	0	0
Services	701,72,73,75–81, 83,84,87,89	15.2	36.4	5.8	(D)	188	330
Business services	73	15.7	38.9	1.6	112	40	48
Computer and data processing services	737	15.7	36.3	1.1	112	38	35
Other business services	731–736,738	19.3	0.0	0.0	17	0	0

See explanatory information and SOURCE at end of table.

[illegible] performing companies [illegible] financed R&D program: 1995

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Industry	SIC code	Federal R&D funds as a percent of net sales: First 4 companies	Next 4 companies	Next 12 companies	Federal R&D funds: First 4 companies	Next 4 companies	Next 12 companies
		[Percent]			[Dollars in millions]		
Health services	80	0.0%	0.0%	0.0%	$3	$0	$0
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	0.0	0.0	0.0	2	0	0
Other health services	802–805,808–809	0.7	0.0	0.0	(D)	0	0
Engineering and management services	87	15.2	55.1	5.5	(D)	179	292
Engineering, architectural, and surveying	871	10.0	2.9	31.4	(D)	143	187
Research, development, and testing	873	43.5	34.1	24.8	(D)	70	78
Other engineering and management services	872,874	39.4	0.0	0.0	(D)	0	0
Other services	701,72,75–79,81, 83,84,89	0.4	2.1	0.0	4	(D)	0
Other nonmanufacturing industries	07–12,14,15, 161–162,17	0.2	0.0	0.0	11	0	0

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

NOTE: Rankings were based on total (company, Federal, and other) R&D funds.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible] other funds for performance [illegible] in current and [illegible]

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Year	Total		Basic research		Applied research		Development	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]							
1953 1/	$3,630	$17,988	$151	$748	$726	$3,598	$2,753	$13,642
1954 1/	4,070	19,941	166	813	814	3,988	3,090	15,140
1955 1/	4,640	22,372	189	911	928	4,474	3,523	16,986
1956	6,605	30,764	253	1,178	1,268	5,906	5,084	23,680
1957	7,731	34,856	271	1,222	1,670	7,529	5,790	26,105
1958	8,389	36,940	295	1,299	1,911	8,415	6,183	27,226
1959	9,618	41,908	320	1,394	1,991	8,675	7,307	31,839
1960	10,509	45,161	376	1,616	2,029	8,719	8,104	34,826
1961	10,908	46,338	395	1,678	1,977	8,398	8,536	36,262
1962	11,464	48,087	488	2,047	2,449	10,273	8,527	35,768
1963	12,630	52,363	522	2,164	2,457	10,187	9,651	40,012
1964	13,512	55,196	549	2,243	2,600	10,621	10,363	42,333
1965	14,185	56,831	592	2,372	2,658	10,649	10,935	43,810
1966	15,548	60,569	624	2,431	2,843	11,075	12,081	47,063
1967	16,385	61,854	629	2,374	2,915	11,004	12,841	48,475
1968	17,429	63,057	642	2,323	3,124	11,302	13,663	49,432
1969	18,308	63,262	618	2,135	3,287	11,358	14,403	49,768
1970	18,067	59,275	602	1,975	3,427	11,243	14,038	46,056
1971	18,320	57,143	590	1,840	3,415	10,652	14,315	44,651
1972	19,552	58,504	593	1,774	3,514	10,515	15,445	46,215
1973	21,249	60,195	631	1,788	3,825	10,836	16,793	47,572
1974	22,887	59,493	699	1,817	4,288	11,146	17,900	46,530
1975	24,187	57,465	730	1,734	4,570	10,858	18,887	44,873
1976	26,997	60,599	819	1,838	5,112	11,475	21,066	47,286
1977	29,825	62,882	911	1,921	5,636	11,883	23,278	49,079
1978 1/	33,304	65,443	1,035	2,034	6,300	12,380	25,969	51,030
1979	38,226	69,212	[illegible]	2,097	7,225	13,082	29,843	54,034
1980 1/	44,505	73,769	1,325	2,196	8,450	14,006	34,730	57,567
1981	51,810	78,488	1,614	2,445	10,699	16,208	39,497	59,835
1982 1/	58,650	83,583	1,904	2,713	12,323	17,562	44,423	63,308
1983	65,268	89,213	2,223	3,039	13,927	19,036	49,118	67,138
1984	74,800	98,525	2,608	3,435	15,765	20,765	56,427	74,324
1985	84,239	107,270	2,862	3,644	18,255	23,246	63,122	80,379
1986	87,823	108,989	4,047	5,022	19,759	24,521	64,017	79,445
1987	92,155	110,950	4,324	5,206	19,813	23,854	68,018	81,890
1988	97,015	112,690	4,500	5,227	20,748	24,100	71,767	83,363
1989	102,055	113,748	5,216	5,814	22,691	25,291	74,148	82,644

See explanatory information and SOURCE at end of table.

[illegible] performance of basic research, applied research, [illegible] in constant dollars: 1953–95

Page 2 of 2

Year	Total		Basic research		Applied research		Development	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]							
1990	$109,727	$117,230	$5,128	$5,479	$24,785	$26,480	$79,814	$85,271
1991	116,952	120,173	7,837	8,053	27,446	28,202	81,669	69,446
1992	119,110	119,110	7,002	7,002	26,168	26,168	85,940	85,940
1993	117,400	114,380	6,919	6,741	24,686	24,051	85,796	83,589
1994	119,595	113,802	7,017	6,677	23,490	22,352	89,088	84,773
1995	132,103	122,590	6,099	5,660	27,454	25,477	98,552	91,455

1/ Character-of-work estimates were made by the National Science Foundation. See: NSF, *National Patterns of R&D Resources: 1996*, Final Report, NSF 96-333.

NOTES: The character-of-work estimation procedure was revised for 1986 and later years; hence, these data are not directly comparable with data for 1985 and earlier years. See technical notes for discussion of this change.

The 1992 gross domestic product (GDP) implicit price deflators were used to convert current dollars to constant dollars.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

Year	Total		Basic research		Applied research		Development	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]							
1953 1/	$2,200	$10,902	$132	$654	$438	$2,170	$1,630	$8,077
1954 1/	2,320	11,367	143	701	492	2,411	1,685	8,256
1955 1/	2,460	11,861	162	781	560	2,700	1,738	8,380
1956	3,277	15,263	216	1,006	794	3,698	2,267	10,559
1957	3,396	15,311	230	1,037	992	4,472	2,174	9,802
1958	3,630	15,984	252	1,110	1,137	5,007	2,241	9,868
1959	3,983	17,355	248	1,081	1,178	5,133	2,557	11,142
1960	4,428	19,029	297	1,276	1,196	5,140	2,935	12,613
1961	4,668	19,830	314	1,334	1,165	4,949	3,189	13,547
1962	5,029	21,095	345	1,447	1,438	6,032	3,246	13,616
1963	5,360	22,222	375	1,555	1,450	6,012	3,535	14,656
1964	5,792	23,660	384	1,569	1,560	6,373	3,848	15,719
1965	6,445	25,821	406	1,627	1,620	6,490	4,419	17,704
1966	7,216	28,111	451	1,757	1,804	7,028	4,961	19,326
1967	8,020	30,276	427	1,612	1,849	6,980	5,744	21,684
1968	8,869	32,088	462	1,671	2,081	7,529	6,326	22,887
1969	9,857	34,060	458	1,583	2,272	7,851	7,127	24,627
1970	10,288	33,753	444	1,457	2,378	7,802	7,466	24,495
1971	10,654	33,231	456	1,422	2,441	7,614	7,757	24,195
1972	11,535	34,515	463	1,385	2,562	7,666	8,510	25,464
1973	13,104	37,122	499	1,414	2,832	8,023	9,773	27,686
1974	14,667	38,126	536	1,393	3,263	8,482	10,868	28,251
1975	15,582	37,021	573	1,361	3,440	8,173	11,569	27,486
1976	17,436	39,138	634	1,423	3,912	8,781	12,890	28,934
1977	19,340	40,776	701	1,478	4,311	9,089	14,328	30,209
1978 1/	22,115	43,456	785	1,543	4,870	9,570	16,460	32,344
1979	25,708	46,547	893	1,617	5,670	10,266	19,145	34,664
1980 1/	30,476	50,515	1,035	1,716	6,550	10,857	22,891	37,943
1981	35,428	53,671	1,313	1,989	8,359	12,663	25,756	39,018
1982 1/	40,105	57,154	1,523	2,170	9,363	13,343	29,219	41,640
1983	44,588	60,946	1,760	2,406	10,286	14,060	32,542	44,481
1984	51,404	67,708	2,132	2,808	11,541	15,202	37,731	49,698
1985	57,043	72,638	2,373	3,022	12,908	16,437	41,762	53,180
1986	59,932	74,376	3,496	4,339	15,082	18,717	41,354	51,320
1987	61,403	73,926	3,583	4,314	15,153	18,243	42,667	51,369
1988	66,672	77,445	3,507	4,074	16,531	19,202	46,634	54,169
1989	73,501	81,923	3,832	4,271	17,993	20,055	51,676	57,597

See explanatory information and SOURCE at end of table.

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Year	Total		Basic research		Applied research		Development	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]							
1990	$81,602	$87,182	$3,760	$4,017	$18,432	$19,692	$59,410	$63,472
1991	90,580	93,074	6,125	6,294	21,425	22,015	63,030	69,446
1992	94,388	94,388	5,816	5,816	21,184	21,184	67,385	67,385
1993	94,591	92,158	5,961	5,808	19,956	19,443	68,678	66,912
1994	97,131	92,426	6,078	5,784	19,372	18,434	71,683	68,211
1995	108,652	100,828	5,379	4,992	23,755	22,044	79,516	73,790

1/ Character-of-work estimates were made by the National Science Foundation. See: NSF, *National Patterns of R&D Resources: 1996*, Final Report, NSF 96-333.

NOTES: The character-of-work estimation procedure was revised for 1986 and later years; hence, these data are not directly comparable with data for 1985 and earlier years. See technical notes for discussion of this change.

The 1992 gross domestic product (GDP) implicit price deflators were used to convert current dollars to constant dollars.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

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Year	Total		Basic research		Applied research		Development	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]							
1953 1/	$1,430	$7,086	$19	$94	$288	$1,427	$1,123	$5,565
1954 1/	1,750	8,574	23	113	322	1,578	1,405	6,884
1955 1/	2,180	10,511	27	130	368	1,774	1,785	8,607
1956	3,328	15,501	37	172	474	2,208	2,817	1,992
1957	4,335	19,545	41	185	678	3,057	3,616	16,303
1958	4,759	20,956	43	189	774	3,408	3,942	17,358
1959	5,635	24,553	72	314	813	3,542	4,750	20,697
1960	6,081	26,132	79	339	833	3,580	5,169	22,213
1961	6,240	26,508	81	344	812	3,449	5,347	22,715
1962	6,434	26,988	143	600	1,011	4,241	5,281	22,152
1963	7,270	30,141	147	609	1,007	4,175	6,116	25,357
1964	7,720	31,536	165	674	1,040	4,248	6,515	26,614
1965	7,740	31,010	186	745	1,038	4,159	6,516	26,106
1966	8,332	32,458	173	674	1,039	4,048	7,120	27,737
1967	8,365	31,578	202	763	1,066	4,024	7,097	26,791
1968	8,560	30,970	180	651	1,043	3,774	7,337	26,545
1969	8,451	29,202	160	553	1,015	3,507	7,276	25,142
1970	7,779	25,522	158	518	1,049	3,442	6,572	21,562
1971	7,666	23,911	134	418	974	3,038	6,558	20,455
1972	8,017	23,989	130	389	952	2,849	6,935	20,751
1973	8,145	23,074	132	374	993	2,813	7,020	19,887
1974	8,220	21,367	163	424	1,025	2,664	7,032	18,279
1975	8,605	20,444	157	373	1,130	2,685	7,318	17,387
1976	9,561	21,461	185	415	1,200	2,694	8,176	18,352
1977	10,485	22,106	210	443	1,325	2,794	8,950	18,870
1978 1/	11,189	21,987	250	491	1,430	2,810	9,509	18,685
1979	12,518	22,665	265	480	1,555	2,815	10,698	19,370
1980 1/	14,029	23,254	290	481	1,900	3,149	11,839	19,624
1981	16,382	24,817	301	456	2,340	3,545	13,741	20,817
1982 1/	18,545	26,429	381	543	2,960	4,218	15,204	21,667
1983	20,680	28,267	463	633	3,641	4,977	16,576	22,657
1984	23,396	30,817	476	627	4,224	5,564	18,696	24,626
1985	27,196	34,631	489	623	5,347	6,809	21,360	27,200
1986	27,891	34,613	551	684	4,678	5,805	22,662	28,124
1987	30,752	37,024	740	891	4,660	5,610	25,352	30,523
1988	30,343	35,246	993	1,153	4,217	4,898	25,133	29,194
1989	28,554	31,826	1,384	1,543	4,698	5,236	22,472	25,047

See explanatory information and SOURCE at end of table.

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Year	Total		Basic research		Applied research		Development	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]							
1990	$28,125	$30,048	$1,368	$1,462	$6,353	$6,787	$20,404	$21,799
1991	26,372	27,098	1,712	1,759	6,021	6,187	18,639	69,446
1992	24,722	24,722	1,186	1,186	4,983	4,983	18,555	18,555
1993	22,809	22,222	958	933	4,730	4,608	17,118	16,678
1994	22,463	21,375	939	894	4,119	3,919	17,405	16,562
1995	23,451	21,762	720	668	3,699	3,433	19,031	17,661

1/ Character-of-work estimates were made by the National Science Foundation. See: NSF, *National Patterns of R&D Resources: 1996*, Final Report, NSF 96-333.

NOTES: The character-of-work estimation procedure was revised for 1986 and later years; hence, these data are not directly comparable with data for 1985 and earlier years. See technical notes for discussion of this change.

The 1992 gross domestic product (GDP) implicit price deflators were used to convert current dollars to constant dollars.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
All Industries		$117,400	$22,809	$94,591	$6,919	$958	$5,961	$24,686	$4,730	$19,956	$85,796	$17,118	$68,678
Manufacturing		86,569	16,669	69,901	4,637	287	4,349	18,184	2,196	15,988	63,749	14,183	49,566
Food, kindred, and tobacco products	20,21	1,345	0	1,345	96	0	96	434	0	434	814	0	814
Textiles and apparel	22,23	(D)	(D)	286	(D)	(D)	44	(D)	(D)	34	(D)	(D)	208
Lumber, wood products, and furniture	24,25	(D)	(D)	196	(D)	(D)	15	48	0	48	(D)	(D)	133
Paper and allied products	26	(D)	(D)	1,191	(D)	(D)	197	(D)	(D)	537	459	0	459
Chemicals and allied products	28	(D)	(D)	16,658	2,276	12	2,264	(D)	(D)	5,810	(D)	(D)	8,584
Industrial chemicals	281–82,286	(D)	(D)	5,165	(D)	(D)	918	(D)	(D)	1,266	(D)	(D)	2,981
Drugs and medicines	283	9,146	15	9,132	(D)	(D)	(D)	3,768	8	3,760	(D)	(D)	(D)
Other chemicals	284–85,287–89	(D)	(D)	2,361	(D)	(D)	(D)	(D)	(D)	783	(D)	(D)	(D)
Petroleum refining and extraction	13,29	2,152	14	2,138	(D)	(D)	(D)	(D)	(D)	(D)	1,084	11	1,073
Rubber products	30	(D)	(D)	1,059	29	0	29	(D)	(D)	160	(D)	(D)	870
Stone, clay, and glass products	32	538	9	529	(D)	(D)	54	(D)	(D)	180	302	7	295
Primary metals	33	669	23	646	(D)	(D)	47	217	6 (S)	211	(D)	(D)	388
Ferrous metals and products	331–32, 3398–99	289	17	272	(D)	(D)	21	(D)	(D)	86	(D)	(D)	165
Nonferrous metals and products	333-36	380	6	374	25	0	25	(D)	(D)	125 (S)	(D)	(D)	223
Fabricated metal products	34	1,158	222	936	(D)	(D)	96	189	8	182	(D)	(D)	659
Machinery	35	8,381	86	8,295	(D)	(D)	283	(D)	(D)	1,616	6,461	65	6,396
Office, computing, and accounting machines	357	4,950	33	4,917	(D)	(D)	92	(D)	(D)	950	3,903	28	3,875
Other machinery, except electrical	351–56,358–59	3,431	53	3,378	(D)	(D)	191	(D)	(D)	666	2,557	37	2,521
Electrical equipment	36	13,349	1,667	11,682	(D)	(D)	364	(D)	(D)	2,904	9,819	1,403	8,422
Radio and TV receiving equipment	365	(D)	(D)	87	10	0	10	(D)	(D)	12	(D)	(D)	64
Communication equipment	366	(D)	(D)	3,954	(D)	(D)	(D)	576	0	576	(D)	(D)	(D)

See explanatory information and SOURCE at end of table

Table A-29. Funds for performance of basic research, applied research, and development, by industry and source of funds: 1993

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Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
Electronic components	367	$5,311	$206	$5,105	(D)	$1	(D)	$1,429	$35 (S)	$1,394	(D)	$170	(D)
Other electrical equipment	361–64,369	(D)	(D)	2,537	(D)	(D)	$113	(D)	(D)	919	(D)	(D)	$1,504
Transportation equipment	37	27,258	10,617	16,640	(D)	(D)	136	2,008	905	1,103	(D)	(D)	15,401
Motor vehicles and motor vehicles equipment	371	(D)	(D)	10,659	(D)	(D)	74	(D)	(D)	462	(D)	(D)	10,123
Other transportation equipment	373–75,379	(D)	(D)	297	(D)	0	(D)	(D)	(D)	12	(D)	(D)	(D)
Aircraft and missiles	372,376	15,056	9,372	5,684	(D)	(D)	(D)	1,453	825	628	(D)	(D)	(D)
Professional and scientific instruments	38	10,119	2,577	7,542	(D)	(D)	402	2,093	297	1,796	(D)	(D)	5,344
Scientific and mechanical measuring instruments	381–82	5,681	2,484	3,196	(D)	(D)	136	1,405	276	1,129	(D)	(D)	1,933
Optical, surgical, photographic, and other instruments	384–87	4,438	92	4,346	(D)	(D)	267	689	21	668	(D)	(D)	3,411
Other manufacturing industries	27,31,39	(D)	(D)	758	(D)	(D)	147	84	0	84	(D)	(D)	527
Nonmanufacturing 1/		30,831	6,140	24,690	$2,282	670	1,612	6,502	2,534	3,967	$22,047	2,935	19,112
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trade	50–59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Services	701,72,73, 75–81,83,84, 87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See explanatory information and SOURCE at end of table

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Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other health services	802–805, 808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other services	701,72,75–79, 81,83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other nonmanufacturing industries	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

1/ Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.
NA = Not available.

NOTE: The character-of-work estimation procedure was revised for 1986 and later years; hence, these data are not directly comparable with data for 1985 and earlier years. See technical notes for a more complete discussion of this change.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1993

[illegible] applied research and [illegible]

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Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
All industries		$119,595	$22,463	$97,131	$7,017	$939	$6,078	$23,490	$4,119	$19,372	$89,088	$17,405	$71,683
Manufacturing		119,595	22,463	97,131	7,017	939	6,078	23,490	4,119	19,372	89,088	17,405	71,683
Food, kindred, and tobacco products	20,21	1,476	0	1,476	114	0	114	473	0	473	889	0	889
Textiles and apparel	22,23	(D)	(D)	316	(D)	(D)	42	(D)	(D)	47	(D)	(D)	228
Lumber, wood products, and furniture	24,25	(D)	(D)	201	(D)	(D)	27	(D)	(D)	43	(D)	(D)	131
Paper and allied products	26	(D)	(D)	1,263	(D)	(D)	211	(D)	(D)	619	433	0	433
Chemicals and allied products	28	(D)	(D)	16,559	2,608	9	2,599	(D)	(D)	5,386	9,186	610	8,575
Industrial chemicals	281–82,286	(D)	(D)	4,780	(D)	(D)	1,066	(D)	(D)	(D)	(D)	(D)	(D)
Drugs and medicines	283	9,633	8	9,625	(D)	1	(D)	3,333	5	3,328	(D)	2	(D)
Other chemicals	284–85,287–89	(D)	(D)	2,154	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Petroleum refining and extraction	13,29	1,950	10	1,939	(D)	0	(D)	694	5	688	(D)	5	(D)
Rubber products	30	(D)	(D)	1,432	33	0	33	(D)	(D)	215	1,184	0	1,184
Stone, clay, and glass products	32	591	38	553	50	0	50	212	37	175	329	1	328
Primary metals	33	690	17	672	(D)	(D)	102	(D)	(D)	206	(D)	(D)	364
Ferrous metals and products	331–32, 3398–99	(D)	(D)	241	(D)	(D)	19	(D)	(D)	84	(D)	(D)	138
Nonferrous metals and products	333–36	(D)	(D)	431	83	0	83	(D)	(D)	122	(D)	(D)	226
Fabricated metal products	34	1,111	243	868	(D)	(D)	78	(D)	(D)	184	833	226	606
Machinery	35	8,110	99	8,011	261	7	254	1,464	35	1,429	6,385	56	6,328
Office, computing, and accounting machines	357	4,106	28	4,078	(D)	(D)	62	(D)	(D)	713	3,316	13	3,303
Other machinery, except electrical	351–56,358–59	4,004	71	3,933	(D)	(D)	192	(D)	(D)	716	3,068	43	3,025
Electrical equipment	36	15,338	1,801	13,537	(D)	(D)	388	(D)	(D)	2,597	12,203	1,653 (S)	10,550
Radio and TV receiving equipment	365	(D)	(D)	64	(D)	(D)	(D)	(D)	0	(D)	36	1	35
Communication equipment	366	(D)	(D)	4,939	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	4,111

See explanatory information and SOURCE at end of table.

[illegible] basic research, applied research, and development, by industry and [illegible]

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Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
Electronic components	367	$6,032	$162	$5,870	(D)	(D)	$121	(D)	(D)	$1,370	$4,529	$150	$4,379
Other electrical equipment	361–64,369	(D)	(D)	2,664	(D)	(D)	118	(D)	(D)	521	(D)	(D)	2,025
Transportation equipment	37	28,087	10,392	17,695	$244	$109	136	$2,044	$784 (S)	1,259	25,799	9,499	16,300
Motor vehicles and motor vehicles equipment	371	(D)	(D)	11,950	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Other transportation equipment	373–75,379	(D)	(D)	279	31	0	31	(D)	(D)	(D)	(D)	(D)	(D)
Aircraft and missiles	372,376	14,260	8,794	5,466	(D)	(D)	(D)	(D)	(D)	(D)	12,787	7,978	4,809
Professional and scientific instruments	38	11,441	3,384	8,058	(D)	(D)	467	2,086	299	1,787	(D)	(D)	5,803
Scientific and mechanical measuring instruments	381-82	6,952	3,266	3,687	(D)	(D)	197	1,409	271	1,138	(D)	(D)	2,351
Optical, surgical, photographic, and other instruments	384–87	4,489	118	4,371	(D)	(D)	270	677	28	649	(D)	(D)	3,452
Other manufacturing industries	27,31,39	(D)	(D)	796	(D)	(D)	93	129	0	129	(D)	(D)	574
Nonmanufacturing 1/		28,846	5,090	23,756	2,036	689	1,346	6,169	2,035	4,134	20,641	2,366 (S)	18,275
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trade	50–59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Services	701,72,73, 75–81,83, 84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See explanatory information and SOURCE at end of table.

Table A-[illegible]. Funds for performance of basic research, applied research, and development, by industry and source of funds: 1995

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Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Computer and data processing services	737	NA	NA NA	NA NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other health services	802–805, 808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Engineering, architectural, and surveying	871	NA	NA NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA NA	NA	NA	NA
Other services	701,72,75–79, 81,83,84,89	NA	NA	NA	NA	NA	NA	NA NA	NA	NA	NA NA	NA NA	NA
Other nonmanufacturing industries	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

1/ Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.
NA = Not available.

NOTE: The character-of-work estimation procedure was revised for 1986 and later years; hence, these data are not directly comparable with data for 1985 and earlier years. See technical notes for a more complete discussion of this change.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

Table [illegible]. Funds for performance of basic research, applied research, and development, by industry and source of funds: 1995

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Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
All Industries		$132,103	$23,451	$108,652	$6,099	$720	$5,379	$27,454	$3,699	$23,755	$98,552	$19,031	$79,516
Manufacturing		100,067	18,831	81,236	3,849	290	3,559	20,416	2,140	18,276	75,804	16,399	59,401
Food, kindred, and tobacco products	20,21	1566	0	1566	153	0	153	510	0	510	903	0	903
Textiles and apparel	22,23	(D)	(D)	381	29	0	29	(D)	(D)	49	(D)	(D)	303
Lumber, wood products, and furniture	24,25	(D)	(D)	229	21	0	21	38	0	38	(D)	(D)	169
Paper and allied products	26	(D)	(D)	1,404	245 (S)	0	245 (S)	(D)	(D)	720 (S)	439	0	439
Chemicals and allied products	28	17,547	210 (S)	17,337	(D)	(D)	1,616	(D)	(D)	5,666	10,241	187 (S)	10,055
Industrial chemicals	281–82,286	(D)	(D)	5,139	(D)	(D)	514	(D)	(D)	1,437	(D)	(D)	3,188
Drugs and medicines	283	10,215	14	10,202	1,018	2	1,016	3,513	5	3,508	5,683	7	5,677
Other chemicals	284–85, 287–89	(D)	(D)	1,996	(D)	(D)	86	(D)	(D)	720	(D)	(D)	1,190
Petroleum refining and extraction	13,29	1,760	6	1,754	115	0	115	(D)	(D)	719	(D)	(D)	920
Rubber products	30	(D)	(D)	1,210	67	0	67	(D)	(D)	229	(D)	(D)	915
Stone, clay, and glass products	32	448	6	441	17	0	17	(D)	(D)	151	(D)	(D)	273
Primary metals	33	593	13	580	47	0	47	(D)	(D)	184	(D)	(D)	349
Ferrous metals and products	331–32, 3398–99	(D)	(D)	217	14	0	14	85	0	85	(D)	(D)	118
Nonferrous metals and products	333–36	(D)	(D)	363	33	0	33	(D)	(D)	100	235	5	231
Fabricated metal products	34	1,023	86	937	(D)	(D)	68	156	13	143	(D)	(D)	726
Machinery	35	(D)	(D)	9,676	(D)	(D)	261	2,431	29	2,402	7,067	54	7,012
Office, computing, and accounting machines	357	(D)	(D)	4,699	(D)	(D)	24	(D)	(D)	1,323	(D)	(D)	3,352 (S)
Other machinery, except electrical	351–56, 358–59	5,041	64	4,976	(D)	(D)	238	(D)	(D)	1,079	(D)	(D)	3,660

See explanatory information and SOURCE at end of table.

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Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
Electrical equipment	36	$18,751	$1,690	$17,060	(D)	(D)	$240	$3,882 (D)	(D)	$3,279	$14,612	$1,070	$13,541
Radio and TV receiving equipment	365	(D)	(D)	114	5	0	5	16	$0	16	(D)	(D)	94
Communication equipment	366	(D)	(D)	3,845	56	0	56	(D)	(D)	664	3,644	519	3,125
Electronic components	367	(D)	(D)	9,628	(D)	(D)	88	2,435	430	2,005	7,705	169	7,535
Other electrical equipment	361–64,369	(D)	(D)	3,473	(D)	(D)	91	(D)	(D)	595	(D)	(D)	2,787
Transportation equipment	37	32,441	13,130	19,311	348	250	98	2,791	705	2,086	29,302	12,175	17,127
Motor vehicles and motor vehicles equipment	371	(D)	(D)	13,590	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	12,865
Other transportation equipment	373–75,379	(D)	(D)	232	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	179
Aircraft and missiles	372,376	16,951	11,462	5,489	252	250	2	1,987	564	1,423	14,712	10,648	4,064
Professional and scientific instruments	38	11,976	3,460 (S)	8,516	(D)	(D)	499	(D)	(D)	2,015	8,812	2,810 (S)	6,002
Scientific and mechanical measuring instruments	381–82	7,146	3,358 (S)	3,787	(D)	(D)	257	(D)	(D)	1,406	(D)	(D)	2,125
Optical, surgical, photographic, and other instruments	384–87	4,831	102	4,729	(D)	(D)	242	634	24	610	(D)	(D)	3,877
Other manufacturing industries	27,31,39	(D)	(D)	835	(D)	(D)	83	84	0	84	668	0	668
Nonmanufacturing		32,036	4,620	27,415	2,250	430	1,820	7,038	1,558	5,480	22,748	2,632	20,115
Transportation and utilities	40–42, 44–49	5,435	252	5,183	(D)	(D)	116	(D)	(D)	953	4,359	245	4,114
Communications	48	(D)	(D)	4,756	(D)	0	(D)	(D)	0	(D)	(D)	(D)	3,852
Telephone communications	481	(D)	(D)	4,697	(D)	0	(D)	(D)	0	(D)	(D)	(D)	3,809
Other communications	482–484,489	59	0	59	(D)	0	(D)	(D)	0	(D)	43	0	43

See explanatory information and SOURCE at end of table.

Table A-31. Funds for performance of basic research, applied research, and development, by industry and source of funds: 1995

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Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
Electric, gas, and sanitary services	49	$440	$93	$347	(D)	(D)	$48	(D)	(D)	$105	$280	$86	$194
Other transportation and utilities	40–42, 44–47	(D)	(D)	80	(D)	$0	(D)	(D)	(D)	(D)	(D)	(D)	68
Trade	50–59	(D)	(D)	7,514	(D)	(D)	211	(D)	(D)	1,236	(D)	(D)	6,067
Finance, insurance, and real estate	60–65,67	(D)	(D)	710	(D)	(D)	115	(D)	(D)	17	(D)	(D)	578
Services	701,72,73, 75–81,83, 84,87,89	17,876	4,270	13,606	$1,766	420	1,346	$4,658	$1,537	3,122	11,452	2,312	9,138
Business services	73	9,293	612	8,681	(D)	(D)	(D)	(D)	(D)	(D)	6,972	276	6,695
Computer and data processing services	737	9,059	514	8,545	(D)	(D)	569	(D)	(D)	1,376	6,796	196	6,600
Other business services	731–736, 738	234	98	136	(D)	(D)	(D)	(D)	(D)	(D)	175	80	95
Health services	80	756	4	753	(D)	(D)	(D)	237	2	235	(D)	(D)	(D)
Offices and clinics of medical doctors, hospital, medical, and dental labs	801,806, 807	(D)	(D)	737	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Other health services	802–805, 808–809	(D)	(D)	16 (S)	1	(D)	(D)	(D)	(D)	(D)	7	0	7
Engineering and management services	87	7,662	3,650	4,011	(D)	(D)	(D)	(D)	(D)	(D)	3,887	2,034 (S)	1,852
Engineering, architectural, and surveying	871	2,933	1,883	1,050	(D)	(D)	(D)	(D)	(D)	(D)	1,519	1,079	440

See explanatory information and SOURCE at end of table.

Table A-[illegible] Funds for [illegible] basic research, applied research, and development, by industry and source of funds: 1995

Page 4 of 4

Industry	SIC Code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
Research, development, and testing	873	(D)	(D)	$2,829	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	$1,287
Other engineering and management services	872,874	(D)	(D)	132	(D)	(D)	$7	(D)	(D)	$0	(D)	(D)	125
Other services	701,72, 75–79,81, 83,84,89	$165	$4	160	(D)	(D)	(D)	$29	$3	26	(D)	(D)	(D)
Other nonmanufacturing industries	07–12,14, 15,161–162, 17	413	11	402	$32	$0	32	(D)	(D)	153	(D)	(D)	217

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

NOTE: The character-of-work estimation procedure was revised for 1986 and later years; hence, these data are not directly comparable with data for 1985 and earlier years. See technical notes for a more complete discussion of this change.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[redacted]

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Industry	SIC code	Total		Size of company											
				Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic
All industries		33,314	8,884	30,284	8,326	1,235	200	1,217	214	274	62	172	43	131	38
Manufacturing		17,537	3,961	15,400	3,546	794	146	955	172	179	38	131	35	78	24
Food, kindred, and tobacco products	20,21	780	211	629	185	45	4	72	10	12	6	12	4	10	2
Textiles and apparel	22,23	623	14	527	1	41	1	38	7	6	1	9	3	2	1
Lumber, wood products, and furniture	24,25	690	155	610	138	31	10	40	6	7	1	1	0	1	0
Paper and allied products	26	239	29	160	12	17	3	41	8	7	1	9	4	6	1
Chemicals and allied products	28	1,600	490	1,386	433	59	12	89	27	39	6	19	8	8	4
Industrial chemicals	281–82,286	386	134	304	106	36	7	29	13	5	2	9	4	3	2
Drugs and medicines	283	339	106	288	93	10	2	26	6	3	0	8	3	4	2
Other chemicals	284–85,287–89	875	250	794	234	13	3	34	8	31	4	2	1	1	0
Petroleum refining and extraction	13,29	54	11	28	1	1	0	10	3	2	1	9	4	4	2
Rubber products	30	920	151	769	120	75	20	61	10	8	0	4	0	2	1
Stone, clay, and glass products	32	399	39	344	28	26	2	22	5	3	1	4	3	0	0
Primary metals	33	258	31	150	19	36	4	50	4	14	3	5	0	3	1
Ferrous metals and products	331–32,3398–99	73	16	17	5	11	4	30	4	12	3	2	0	1	0
Nonferrous metals and products	333–36	185	15	132	14	25	0	20	0	2	0	3	0	2	1
Fabricated metal products	34	1,392	379	1,233	346	68	19	69	9	8	3	14	2	0	0
Machinery	35	3,937	1,190	3,613	1,153	131	11	150	19	22	2	15	4	6	1
Office, computing, and accounting machines	357	426	104	377	99	15	1	25	3	6	0	2	0	1	1
Other machinery, except electrical	351–56,358–59	3,511	1,086	3,236	1,054	116	10	125	16	16	2	13	4	5	0
Electrical equipment	36	2,475	287	2,195	257	111	7	133	15	15	5	9	0	12	4
Radio and TV receiving equipment	365	84	7	75	6	3	0	6	1	0	0	0	0	0	0
Communication equipment	366	466	55	404	47	32	3	24	4	2	0	2	0	2	1
Electronic components	367	893	75	786	63	39	3	56	6	7	2	2	0	3	1
Other electrical equipment	361–64,369	1,032	151	930	141	37	1	47	4	6	3	5	0	7	2

See explanatory information and SOURCE at end of table.

[illegible] companies conducting basic research and [illegible] R&D-performing companies, by industry and size of company: [illegible]

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Industry	SIC code	Total		Size of company											
				Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic
Transportation equipment	37	599	259	462	202	35	24	63	26	15	3	9	0	15	4
Motor vehicles and motor vehicles equipment	371	483	234	390	183	29	23	46	25	9	2	5	0	4	1
Other transportation equipment	373–75,379	31	1	14	0	3	1	9	0	0	0	3	0	2	0
Aircraft and missiles	372,376	85	24	58	19	3	0	8	1	6	1	1	0	9	3
Professional and scientific instruments	38	2,663	515	2,489	473	89	25	68	10	9	5	2	0	6	2
Scientific and mechanical measuring instruments	381–82	1,731	268	1,667	257	33	5	23	4	3	1	1	0	4	1
Optical, surgical, photographic, and other instruments	384–87	933	247	823	216	56	20	45	6	6	4	1	0	2	1
Other manufacturing industries	27,31,39	908	201	805	179	30	5	48	13	11	0	10	3	3	1
Nonmanufacturing		15,777	4,923	14,884	4,780	441	54	262	43	95	24	41	8	53	14
Transportation and utilities	40–42,44–49	249	53	123	33	2	0	70	7	18	5	15	4	21	4
Communications	48	99	4	58	2	2	0	27	1	1	0	0	0	11	1
Telephone communications	481	63	1	25	0	0	0	25	0	1	0	0	0	11	1
Other communications	482–484,489	37	3	32	2	2	0	2	1	0	0	0	0	0	0
Electric, gas, and sanitary services	49	132	46	64	32	0	0	38	5	16	5	13	4	2	0
Other transportation and utilities	40–42,44–47	18	4	2	0	0	0	5	1	1	0	2	0	8	3
Trade	50–59	5,727	1,938	5,593	1,901	22	3	52	10	40	18	5	0	15	6
Finance, insurance, and real estate	60–65,67	169	105	74	67	57	35	15	2	16	0	2	0	5	1
Services	701,72,73,75–81,83,84,87,89	8,286	2,565	8,034	2,525	100	15	109	18	17	1	16	4	10	2
Business services	73	4,266	1,097	4,106	1,079	68	8	68	8	10	1	7	0	7	1
Computer and data processing services	737	3,557	769	3,429	756	56	7	57	6	7	0	5	0	3	0
Other business services	731–736,738	709	328	677	323	12	1	11	2	3	1	2	0	4	1

See explanatory information and SOURCE at end of table.

Table A-32. Number of companies performing basic research and total number of R&D-performing companies[1] by industry and size of company: 1995

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Industry	SIC code	Total		Size of company											
				Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic
Health services	80	1,055	200	1,036	194	6	0	9	3	0	0	3	2	1	1
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	745	197	730	193	6	0	5	2	0	0	2	1	1	1
Other health services	802–805, 808–809	310	3	306	1	0	0	3	1	0	0	1	1	0	0
Engineering and management services	87	2,666	1,261	2,613	1,249	22	6	24	6	3	0	3	1	1	0
Engineering, architectural, and surveying	871	1,052	344	1,013	335	15	3	20	6	2	0	1	0	1	0
Research, development, and testing	873	1,333	891	1,324	889	6	2	2	0	0	0	1	0	0	0
Other engineering and management services	872,874	281	27	276	25	1	1	2	0	1	0	1	1	0	0
Other services	701,72,75–79, 81,83,84,89	300	7	279	4	4	1	8	1	4	0	3	1	1	0
Other nonmanufacturing industries	07–12,14,15, 161–162,17	1,344	261	1,059	254	259	1	16	5	5	0	3	0	2	1

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible] R&D performance [illegible] product field and source of funds: [illegible]

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Product field	SIC code	Total	Federal	Company
		[Dollars in millions]		
Total		$52,260	$4,862	$47,398
Food and kindred products	20	893	(D)	(D)
Textile mill products	22	188	(D)	(D)
Chemicals and allied products	28	10,172	28	10,144
Industrial inorganic and organic chemicals	281,286	798	3	795
Plastics materials and synthetic resins, rubber, and fibers	282	1,311	9	1,302
Drugs and medicines	283	6,343	8	6,335
Agricultural chemicals	287	643	(D)	(D)
Other chemicals	284–85,289	1,077	(D)	(D)
Petroleum refining	29	798	13	785
Rubber and miscellaneous plastics products	30	598	(D)	(D)
Stone, clay, and glass products	32	177	5	172
Primary metals	33	253	21	232
Ferrous metals and products	331–32,3398–99	137	(D)	(D)
Nonferrous metals and products	333–36	115	(D)	(D)
Fabricated metal products	34	695	337	358
Ordnance and accessories, n.e.c.	348	(D)	(D)	(D)
Other fabricated metal products	341–47,349	(D)	(D)	(D)
Machinery	35	7,404	167	7,237
Engines and turbines	351	1,660	156	1,504
Farm machinery and equipment	352	249	0	249
Construction, mining, and materials handling machinery	353	482	(D)	(D)
Metalworking machinery and equipment	354	103	(D)	(D)
Office, computing, and accounting machines	357	4,392	(D)	(D)
Other machinery, except electrical	355–56,358–59	517	(D)	(D)
Electrical equipment	36	10,048	1,182	8,866
Electric transmission and distribution equipment	361,3825	166	(D)	(D)
Electrical industrial apparatus	362	155	26	129
Radio and TV receiving equipment	365	90	(D)	(D)
Communication equipment	366	5,084	741	4,343
Electronic components	367	3,819	382	3,437
Other electrical equipment and supplies	363–64,368–69	733	(D)	(D)
Transportation equipment	37	9,690	1,390	8,300
Motor vehicles and equipment	371	7,254	(D)	(D)
Other transportation equipment	373–75,379	(D)	(D)	(D)
Aircraft and parts	372	(D)	(D)	(D)
Guided missiles and spacecraft	376	788	693	95
Professional and scientific instruments	38, except 3825	2,030	401	1,629
Scientific and mechanical measuring instruments	381–82	1,071	(D)	(D)
Optical, surgical, photographic, and other instruments	383–87	958	(D)	(D)

See explanatory information and SOURCE at end of table.

[illegible] R&D performance [illegible] 1995

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Product field	SIC code	Total	Federal	Company
		[Dollars in millions]		
Lumber and wood products	24	$26	$0	$26
Paper and allied products	26	276	(D)	(D)
Leather	31	11	0	11
Software	737	4,577	57	4,520
Other product fields, n.e.c.	-	4,424	1,252	3,172

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
n.e.c = Not elsewhere classified.

NOTE: Imputation of R&D expenditures by product field was eliminated beginning in 1985. This table, therefore, contains only applied research and development data reported by survey respondents who received form RD-1L. See Table A-34 for coverage ratios showing the percentage of each industry's applied research and development funds that respondents distributed by product field.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

Industry and size of company	SIC code	Coverage ratio	Applied R&D Total	Food and kindred products 20	Textile mill products 22	Paper and allied products 26	Chemicals 28	Petroleum refining 29	Rubber products 30
			[Dollars in millions]						
All Industries		0.53	$52,280	$883	$188	$276	$10,172	$798	$588
Distribution by industry:									
Manufacturing		0.54	41,080	703	(D)	(D)	9,108	678	(D)
Food, kindred, and tobacco products	20,21	0.70	884	573	(D)	(D)	44	(D)	(D)
Textiles and apparel	22,23	0.23	102	(D)	78	0	5	(D)	(D)
Lumber, wood products, and furniture	24,25	0.23	61	0	0	0	0	0	(D)
Paper and allied products	26	0.71	292	(D)	(D)	140	45	0	15
Chemicals and allied products	28	0.75	9,488	97	(D)	(D)	8,386	47	22
Industrial chemicals	281–82,286	0.61	3,001	(D)	(D)	(D)	2,522	(D)	(D)
Drugs and medicines	283	0.87	5,254	(D)	(D)	(D)	4,889	0	(D)
Other chemicals	284–85,287–89	0.72	1,234	64	(D)	(D)	975	(D)	(D)
Petroleum refining and extraction	13,29	0.82	1,149	0	(D)	0	317	612	57
Rubber products	30	0.43	579	(D)	(D)	(D)	66	(D)	434
Stone, clay, and glass products	32	0.36	226	0	(D)	0	73	0	(D)
Primary metals	33	0.73	243	(D)	0	0	4	(D)	(D)
Ferrous metals and products	331–32,3398–99	0.79	166	(D)	0	0	3	(D)	(D)
Nonferrous metals and products	333–36	0.66	76	0	0	0	1	0	(D)
Fabricated metal products	34	0.49	594	(D)	(D)	(D)	7	0	20
Machinery	35	0.52	3,989	11	(D)	0	15	(D)	(D)
Office, computing, and accounting machines	357	0.41	1,485	0	0	0	0	0	0
Other machinery, except electrical	351–56,358–59	0.62	2,504	11	(D)	0	15	(D)	(D)
Electrical equipment	36	0.41	5,024	(D)	0	(D)	72	(D)	8
Radio and TV receiving equipment	365	0.20	19	0	0	0	0	0	0
Communication equipment	366	0.27	992	0	0	0	0	0	0
Electronic components	367	0.35	1,863	0	0	(D)	2	0	(D)
Other electrical equipment	361–64,369	0.65	2,149	(D)	0	(D)	69	(D)	(D)

See explanatory information and SOURCE at end of table.

Table A-34. Total (company, Federal, and other) funds for applied R&D performance, by industry, size of company, and product field: 1995

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Industry and size of company	SIC code	Coverage ratio	Applied R&D Total	Food and kindred products 20	Textile mill products 22	Paper and allied products 26	Chemicals 28	Petroleum refining 29	Rubber products 30
			[Dollars in millions]						
Distribution by industry:									
Transportation equipment	37	0.62	$15,270	$0	(D)	0	$3	(D)	(D)
Motor vehicles and motor vehicles equipment	371	0.97	(D)	0	$0	$0	2	$0	$0
Other transportation equipment	373–75,379	0.85	(D)	0	0	0	0	0	0
Aircraft and missiles	372,376	0.26	5,490	0	(D)	0	1	(D)	(D)
Professional and scientific instruments	38	0.26	2,825	0	0	0	55	0	(D)
Scientific and mechanical measuring instruments	381–82	0.27	1,831	0	0	0	0	0	(D)
Optical, surgical, photographic, and other instruments	384–87	0.24	993	0	0	0	55	0	(D)
Other manufacturing industries	27,31,39	0.54	334	0	(D)	8	6	0	(D)
Nonmanufacturing		0.52	11,199	190	(D)	(D)	1,062	119	(D)
Transportation and utilities	40–42,44–49	0.79	4,226	0	0	0	0	0	0
Communications	48	0.80	(D)	0	0	0	0	0	0
Telephone communications	481	0.80	(D)	0	0	0	0	0	0
Other communications	482–484,489	0.26	(D)	0	0	0	0	0	0
Electric, gas, and sanitary services	49	0.71	199	0	0	0	0	0	0
Other transportation and utilities	40–42,44–47	0.68	(D)	0	0	0	0	0	0
Trade	50–59	0.70	4,029	113	(D)	(D)	74	(D)	(D)
Finance, insurance, and real estate	60–65,67	0.22	(D)	0	0	0	0	0	0
Services	701,72,73,75–81,83,84,87,89	0.32	2,749	(D)	(D)	0	982	(D)	0
Business services	73	0.36	1,068	0	0	0	0	0	0
Computer and data processing services	737	0.37	1,050	0	0	0	0	0	0
Other business services	731–736,738	0.13	18	0	0	0	0	0	0

See explanatory information and SOURCE at end of table.

Table A-4. Total (company, Federal, and other) funds for applied R&D performance, by industry, size of company, and product field: 1995

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Industry and size of company	SIC code	Coverage ratio	Applied R&D Total	Food and kindred products 20	Textile mill products 22	Paper and allied products 26	Chemicals 28	Petroleum refining 29	Rubber products 30
			[Dollars in millions]						
Distribution by industry:									
Health services	80	0.76	(D)	(D)	$0	$0	$459	$0	$0
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	0.77	(D)	(D)	0	0	459	0	0
Other health services	802–805,808–809	0.07	(D)	$0	0	0	0	0	0
Engineering and management services	87	0.19	$1,043	(D)	(D)	0	519	(D)	0
Engineering, architectural, and surveying	871	0.15	(D)	0	0	0	0	(D)	0
Research, development, and testing	873	0.21	817	(D)	(D)	0	519	(D)	0
Other engineering and management services	872,874	0.10	(D)	0	0	0	0	0	0
Other services	701,72,75–79, 81,83,84,89	0.65	(D)	0	0	0	4	0	0
Other nonmanufacturing industries	07–12,14,15, 161–162,17	0.43	185	(D)	0	(D)	5	(D)	(D)
Distribution by size of company: [Number of employees]									
Total		1.00	52,260	893	188	276	10,172	798	598
Fewer than 500		0.19	2,556	25	(D)	(D)	694	11	15
500 to 999		0.46	1,446	87	14	7	157	(D)	(D)
1,000 to 4,999		0.59	7,630	187	54	52	2,175	4	82
5,000 to 9,999		0.62	5,345	155	(D)	23	995	(D)	29
10,000 to 24,999		0.47	5,492	139	(D)	52	2,823	418	68
25,000 or more		0.64	29,790	299	88	(D)	3,328	302	(D)

See explanatory information and SOURCE at end of table.

[illegible]

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Industry and size of company	SIC code	Stone, clay and glass products 32	Primary metals 33	Fabricated metal products 34	Machinery 35	Electrical equipment 36	Transportation equipment 37	Professional and scientific instruments 38	Other product fields n.e.c. ...
		[Dollars in millions]							
All Industries		$177	$253	$695	$7,404	$10,048	$9,690	$2,030	$9,038
Distribution by industry:									
Manufacturing		(D)	250	(D)	4,291	5,478	9,584	1,955	7,118
Food, kindred, and tobacco products	20,21	0	0	0	8	2	0	0	(D)
Textiles and apparel	22,23	0	0	0	4	0	0	0	8
Lumber, wood products, and furniture	24,25	0	2	0	0	1	3	0	(D)
Paper and allied products	26	(D)	0	(D)	5	0	0	11	67
Chemicals and allied products	28	8	18	(D)	17	73	23	326	269
Industrial chemicals	281–82,286	(D)	10	0	13	63	8	124	121
Drugs and medicines	283	(D)	1	(D)	3	1	0	202	117
Other chemicals	284–85,287–89	(D)	7	(D)	2	9	16	0	30
Petroleum refining and extraction	13,29	(D)	1	(D)	20	9	0	34	58
Rubber products	30	(D)	0	2	2	10	27	3	(D)
Stone, clay, and glass products	32	110	0	0	3	2	34	0	4
Primary metals	33	0	176	16	4	13	10	1	(D)
Ferrous metals and products	331–32,3398–99	0	129	7	3	2	8	0	0
Nonferrous metals and products	333–36	0	46	9	1	11	2	1	(D)
Fabricated metal products	34	(D)	7	294	91	11	26	5	128
Machinery	35	(D)	3	67	2,821	282	231	86	449
Office, computing, and accounting machines	357	0	0	(D)	1,268	187	0	0	(D)
Other machinery, except electrical	35–56,358–59	(D)	3	(D)	1,553	95	231	86	(D)
Electrical equipment	36	(D)	1	(D)	155	3,362	973	72	250
Radio and TV receiving equipment	365	0	0	0	0	12	0	1	6
Communication equipment	366	0	0	0	1	954	14	4	19
Electronic components	367	0	0	(D)	24	1,741	0	13	(D)
Other electrical equipment	361–64,369	(D)	1	(D)	129	654	959	55	(D)

See explanatory information and SOURCE at end of table.

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Industry and size of company	SIC code	Stone, clay and glass products 32	Primary metals 33	Fabricated metal products 34	Machinery 35	Electrical equipment 36	Transportation equipment 37	Professional and scientific instruments 38	Other product fields n.e.c. ...
		[Dollars in millions]							
Distribution by industry:									
Transportation equipment	37	(D)	$42	(D)	$961	$1,242	$8,062	$75	$4,721
Motor vehicles and motor vehicles equipment	371	$0	0	(D)	499	337	7,242	0	(D)
Other transportation equipment	373–75,379	0	36	$0	0	0	29	0	(D)
Aircraft and missiles	372,376	(D)	6	(D)	463	905	792	75	(D)
Professional and scientific instruments	38	(D)	1	21	198	437	194	1,341	567
Scientific and mechanical measuring instruments	381–82	(D)	0	14	197	390	185	831	214
Optical, surgical, photographic, and other instruments	384–87	(D)	1	7	1	47	9	510	353
Other manufacturing industries	27,31,39	0	1	(D)	2	34	1	0	264
Nonmanufacturing		(D)	2	(D)	3,114	4,570	107	74	1,921
Transportation and utilities	40–42,44–49	0	0	(D)	508	3,415	16	(D)	279
Communications	48	0	0	0	503	3,378	0	0	(D)
Telephone communications	481	0	0	0	503	3,378	0	0	(D)
Other communications	482–484,489	0	0	0	0	0	0	0	(D)
Electric, gas, and sanitary services	49	0	0	(D)	5	37	8	(D)	141
Other transportation and utilities	40–42,44–47	0	0	(D)	0	0	8	0	(D)
Trade	50–59	(D)	0	(D)	2,511	1,021	33	19	251
Finance, insurance, and real estate	60–65,67	0	0	0	0	0	0	0	(D)
Services	701,72,73,75–81,83,84,87,89	(D)	1	0	66	123	59	46	1,330
Business services	73	0	0	0	14	57	0	19	978
Computer and data processing services	737	0	0	0	14	54	0	(D)	(D)
Other business services	731–736,738	0	0	0	0	2	0	(D)	(D)

See explanatory information and SOURCE at end of table.

[illegible] Federal, and other funds for applied R&D performance, by industry, size of company, and product field: 1995

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Industry and size of company	SIC code	Stone, clay and glass products 32	Primary metals 33	Fabricated metal products 34	Machinery 35	Electrical equipment 36	Transportation equipment 37	Professional and scientific instruments 38	Other product fields n.e.c. ...
		[Dollars in millions]							
Distribution by industry:									
Health services	80	(D)	$0	$0	$0	$34	$10	$5	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	(D)	0	0	0	34	10	5	(D)
Other health services	802–805,808–809	$0	0	0	0	0	0	0	(D)
Engineering and management services	87	(D)	1	0	12	15	49	22	$315
Engineering, architectural, and surveying	871	0	0	0	0	14	49	3	(D)
Research, development, and testing	873	(D)	1	0	12	1	0	19	188
Other engineering and management services	872,874	0	0	0	0	0	0	0	(D)
Other services	701,72,75-79, 81,83,84,89	0	0	0	40	18	0	0	(D)
Other nonmanufacturing industries	07–12,14,15, 161–162,17	(D)	1	(D)	29	11	0	0	(D)
Distribution by size of company: [Number of employees]									
Total		177	253	695	7,404	10,048	9,690	2,030	9,038
Fewer than 500		(D)	7	(D)	244	691	75	281	473
500 to 999		12	10	44	158	459	54	112	240
1,000 to 4,999		22	59	137	1,133	1,935	489	452	848
5,000 to 9,999		(D)	63	56	781	1,184	352	206	1,446
10,000 to 24,999		(D)	87	125	475	172	204	253	551
25,000 or more		(D)	26	(D)	4,613	5,606	8,516	726	5,479

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
n.e.c. = Not elsewhere classified. Includes lumber and wood products (SIC 24) and Leather (SIC 31).

NOTE: Imputation of R&D expenditures by product field was eliminated beginning in 1985. This table, therefore, contains only data reported by survey respondents who received form RD-1L.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible] funds for [illegible] R&D performance, by industry, size of company, and detailed product field: 1995

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Industry and size of company	SIC code	Chemicals: Industrial inorganic and organic chemicals 281,286	Chemicals: Plastics, synthetic resins, rubber, and fibers 282	Chemicals: Drugs and medicines 283	Chemicals: Agricultural chemicals 287	Chemicals: Other chemicals 284-85, 289	Primary metals: Ferrous metals and products 331-32 3398-99	Primary metals: Nonferrous metal and products 333-36	Fabricated metals: Other fabricated metal products 341-47, 349	Fabricated metals: Ordnance and accessories n.e.c. 348	Computer programming, data processing, and other computer related services 737
		[Dollars in millions]									
Total		$798	$1,311	$6,343	$643	$1,077	$137	$115	(D)	(D)	$4,577
Distribution by industry:											
Manufacturing		782	1,294	5,351	(D)	1,047	(D)	(D)	(D)	(D)	320
Food, kindred, and tobacco products	20,21	(D)	(D)	(D)	3	(D)	0	0	0	0	0
Textiles and apparel	22,23	0	(D)	0	0	0	0	0	0	0	0
Lumber, wood products, and furniture	24,25	0	0	0	0	0	0	(D)	0	0	0
Paper and allied products	26	13	21	0	0	11	0	0	(D)	0	0
Chemicals and allied products	28	602	870	5,324	634	919	(D)	16	(D)	(D)	(D)
Industrial chemicals	281–82,286	450	836	(D)	482	175	0	(D)	0	(D)	0
Drugs and medicines	283	(D)	(D)	4,601	134	66	0	(D)	(D)	0	0
Other chemicals	284–85,287–89	(D)	(D)	(D)	18	677	(D)	(D)	(D)	(D)	(D)
Petroleum refining and extraction	13,29	87	151	0	0	(D)	0	(D)	(D)	0	(D)
Rubber products	30	(D)	64	(D)	0	(D)	0	(D)	2	0	(D)
Stone, clay, and glass products	32	(D)	(D)	0	(D)	(D)	0	0	0	0	0
Primary metals	33	(D)	(D)	(D)	0	(D)	129	47	16	0	0
Ferrous metals and products	331–32, 3398–99	(D)	(D)	0	0	(D)	129	(D)	7	0	0
Nonferrous metals and products	333–36	0	0	(D)	0	0	0	(D)	9	0	0
Fabricated metal products	34	0	7	0	0	0	(D)	(D)	99	9	0
Machinery	35	(D)	(D)	(D)	0	0	(D)	(D)	67	0	51
Office, computing, and accounting machines	357	0	[illegible]	0	0	0	0	0	(D)	0	(D)
Other machinery, except electrical	351–56,358–59	(D)	[illegible]	(D)	0	0	(D)	(D)	(D)	0	(D)

See explanatory information and SOURCE at end of table.

Table A-[illegible] Total (company, Federal, and other) funds for applied R&D performance, by industry, size of company, and detailed product field: 1995

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Industry and size of company	SIC code	Chemicals: Industrial inorganic and organic chemicals 281,286	Chemicals: Plastics, synthetic resins, rubber, and fibers 282	Chemicals: Drugs and medicines 283	Chemicals: Agricultural chemicals 287	Chemicals: Other chemicals 284-85, 289	Primary metals: Ferrous metals and products 331-32 3398-99	Primary metals: Nonferrous metal and products 333-36	Fabricated metals: Other fabricated metal products 341-47, 349	Fabricated metals: Ordnance and accessories n.e.c. 348	Computer programming, data processing, and other computer related services 737
		[Dollars in millions]									
Distribution by industry:											
Electrical equipment	36	$6	(D)	$0	$0	(D)	$0	(D)	(D)	(D)	$118
Radio and TV receiving equipment	365	0	$0	0	0	$0	0	$0	$0	$0	0
Communication equipment	366	(D)	0	0	0	0	0	0	0	0	(D)
Electronic components	367	0	(D)	0	0	(D)	0	0	(D)	0	(D)
Other electrical equipment	361–64,369	(D)	(D)	0	0	(D)	0	(D)	(D)	(D)	(D)
Transportation equipment	37	0	(D)	0	0	(D)	(D)	(D)	(D)	(D)	(D)
Motor vehicles and motor vehicles equipment	371	0	(D)	0	0	0	0	0	(D)	(D)	(D)
Other transportation equipment	373–75,379	0	0	0	0	0	0	(D)	0	0	0
Aircraft and missiles	372,376	0	(D)	0	0	(D)	(D)	(D)	(D)	(D)	(D)
Professional and scientific instruments	38	(D)	48	5	0	1	(D)	(D)	21	(D)	21
Scientific and mechanical measuring instruments	381–82	(D)	0	0	0	0	0	0	14	(D)	6
Optical, surgical, photographic, and other instruments	384–87	(D)	48	5	0	1	(D)	(D)	7	0	15
Other manufacturing industries	27,31,39	(D)	(D)	0	0	0	0	(D)	(D)	0	47
Nonmanufacturing		16	17	992	(D)	30	(D)	(D)	(D)	(D)	4,257
Transportation and utilities	40–42,44–49	(D)	(D)	0	0	0	(D)	0	(D)	0	145
Communications	48	0	0	0	0	0	0	0	0	0	(D)
Telephone communications	481	0	0	0	0	0	0	0	0	0	(D)
Other communications	482–484,489	0	0	0	0	0	0	0	0	0	(D)
Electric, gas, and sanitary services	49	(D)	(D)	0	0	0	(D)	0	(D)	0	(D)
Other transportation and utilities	40–42,44–47	0	0	0	0	0	0	0	(D)	0	16

See explanatory information and SOURCE at end of table.

Table A-30. Total (company, Federal, and other) funds for applied R&D performance, by industry, size of company, and detailed product field: 1995

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Industry and size of company	SIC code	Chemicals					Primary metals		Fabricated metals		Computer programming, data processing, and other computer related services 737
		Industrial inorganic and organic chemicals 281,286	Plastics, synthetic resins, rubber, and fibers 282	Drugs and medicines 283	Agricultural chemicals 287	Other chemicals 284-85, 289	Ferrous metals and products 331-32 3398-99	Nonferrous metal and products 333-36	Other fabricated metal products 341-47, 349	Ordnance and accessories n.e.c. 348	
		[Dollars in millions]									
Distribution by industry:											
Trade	50–59	$7	(D)	$30	$0	(D)	$0	$0	(D)	$0	$1,007
Finance, insurance, and real estate	60–65,67	0	$0	0	0	$0	0	0	$0	0	106
Services	701,72,73, 75–81,83, 84,87,89	(D)	10	962	(D)	0	0	(D)	0	(D)	2,989
Business services	73	0	0	0	0	0	0	0	0	0	2,957
Computer and data processing services	737	0	0	0	0	0	0	0	0	0	(D)
Other business services	731–736,738	0	0	0	0	0	0	0	0	0	(D)
Health services	80	0	(D)	(D)	(D)	0	0	0	0	0	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	0	(D)	(D)	(D)	0	0	0	0	0	(D)
Other health services	802–805, 808–809	0	0	0	0	0	0	0	0	0	0
Engineering and management services	87	(D)	(D)	(D)	0	0	0	(D)	0	(D)	10
Engineering, architectural, and surveying	871	0	0	0	0	0	0	0	0	0	(D)
Research, development, and testing	873	(D)	(D)	(D)	0	0	0	(D)	0	(D)	(D)
Other engineering and management services	872,874	0	0	0	0	0	0	0	0	0	(D)
Other services	701,72,75–79, 81,83,84,89	0	(D)	0	0	0	0	0	0	0	(D)

See explanatory information and SOURCE at end of table.

[illegible] funds for applied R&D performance, by industry, size of company, and detailed product field: 1993

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Industry and size of company	SIC code	Chemicals					Primary metals		Fabricated metals		Computer programming, data processing, and other computer related services 737
		Industrial inorganic and organic chemicals 281,286	Plastics, synthetic resins, rubber, and fibers 282	Drugs and medicines 283	Agricultural chemicals 287	Other chemicals 284-85, 289	Ferrous metals and products 331-32 3398-99	Nonferrous metal and products 333-36	Other fabricated metal products 341-47, 349	Ordnance and accessories n.e.c. 348	
		[Dollars in millions]									
Distribution by industry:											
Other nonmanufacturing industries	07–12,14,15, 161–162,17	(D)	(D)	$0	$0	(D)	$0	(D)	(D)	$0	(D)
Distribution by size of company: **[Number of employees]**											
Total		$798	$1,311	6,343	643	$1,077	137	$115	(D)	(D)	$4,577
Fewer than 500		35	31	591	10	(D)	(D)	5	(D)	(D)	268
500 to 999		31	20	(D)	(D)	29	(D)	7	32	(D)	537
1,000 to 4,999		234	190	1,503	41	197	9	51	99	(D)	1,012
5,000 to 9,999		60	63	(D)	109	164	62	(D)	39	(D)	452
10,000 to 24,999		214	412	1,783	(D)	$227	(D)	50	90	(D)	1,060 (S)
25,000 or more		178	595	1,808	296	(D)	(D)	(D)	(D)	0	1,247

See explanatory information and SOURCE at end of table.

[illegible] expenditures for applied R&D performance, by industry, size of company, and detailed product field: [illegible]

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Industry and size of company	SIC code	Machinery						Electrical equipment			
		Engines and turbines 351	Farm machinery and equipment 352	Construction, mining, and materials handling machinery 353	Metal-working machinery and equipment 354	Office computing and accounting machines 357	Other machinery except electrical 355-56 358-59	Electric transmission and distribution equipment 361	Electrical industrial apparatus 362	Radio and television receiving sets except communication types 365	Communications equipment 366
		[Dollars in millions]									
All industries		$1,660	$249	$482	$103	$4,392	$517	$166	$155	$90	$5,084
Distribution by industry:											
Manufacturing		1,648	(D)	454	(D)	1,336	513	154	152	(D)	1,585
Food, kindred, and tobacco products	20,21	$0	(D)	$0	$0	$0	(D)	$0	(D)	$0	$0
Textiles and apparel	22,23	0	$0	0	(D)	0	(D)	0	(D)	0	0
Lumber, wood products, and furniture	24,25	0	0	0	0	0	$0	0	$0	0	0
Paper and allied products	26	0	0	0	0	1	(D)	0	0	0	0
Chemicals and allied products	28	0	0	(D)	0	(D)	8	0	(D)	0	0
Industrial chemicals	281–82,286	0	0	(D)	0	0	(D)	0	0	0	0
Drugs and medicines	283	0	0	0	0	(D)	(D)	0	(D)	0	0
Other chemicals	284–85,287–89	0	0	0	0	0	(D)	0	0	0	0
Petroleum refining and extraction	13,29	0	0	0	0	(D)	(D)	0	0	0	0
Rubber products	30	0	0	(D)	(D)	0	(D)	0	0	0	0
Stone, clay, and glass products	32	0	0	0	(D)	0	0	0	0	0	0
Primary metals	33	0	(D)	(D)	(D)	0	(D)	(D)	(D)	0	(D)
Ferrous metals and products	331–32, 3398–99	0	(D)	(D)	(D)	0	(D)	0	(D)	0	0
Nonferrous metals and products	333–36	0	0	0	0	0	(D)	(D)	(D)	0	(D)
Fabricated metal products	34	(D)	(D)	(D)	4	(D)	10	(D)	(D)	0	(D)
Machinery	35	621	224	390	90	1,264	232	(D)	7	0	(D)
Office, computing, and accounting machines	357	0	0	0	0	1,264	(D)	(D)	0	0	(D)
Other machinery, except electrical	351–56,358–59	621	224	390	90	0	(D)	0	7	0	(D)

See explanatory information and SOURCE at end of table.

[illegible] size of company, and detailed product field: [illegible]

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Industry and size of company	SIC code	Machinery						Electrical equipment			
		Engines and turbines 351	Farm machinery and equipment 352	Construction, mining, and materials handling machinery 353	Metal-working machinery and equipment 354	Office computing and accounting machines 357	Other machinery except electrical 355-56 358-59	Electric transmission and distribution equipment 361	Electrical industrial apparatus 362	Radio and television receiving sets except communi-cation types 365	Communications equipment 366
		[Dollars in millions]									
Distribution by industry:											
Electrical equipment	36	(D)	0	(D)	(D)	21	13	127	95	59	937
Radio and TV receiving equipment	365	0	0	0	0	0	0	0	0	(D)	0
Communication equipment	366	0	0	0	(D)	(D)	0	(D)	(D)	0	860
Electronic components	367	0	0	(D)	(D)	(D)	0	0	(D)	(D)	45
Other electrical equipment	361–64,369	(D)	0	(D)	0	0	13	(D)	73	0	32
Transportation equipment	37	(D)	(D)	(D)	$0	(D)	(D)	(D)	(D)	$0	(D)
Motor vehicles and motor vehicles equipment	371	(D)	(D)	$0	0	$0	(D)	$0	$0	0	(D)
Other transportation equipment	373–75,379	$0	$0	0	0	0	$0	0	0	0	$0
Aircraft and missiles	372,376	(D)	0	(D)	0	(D)	14	(D)	(D)	0	(D)
Professional and scientific instruments	38	0	0	0	0	0	(D)	(D)	(D)	(D)	35
Scientific and mechanical measuring instruments	381–82	0	0	0	0	0	(D)	(D)	(D)	(D)	35
Optical, surgical, photographic, and other instruments	384–87	0	0	0	0	0	(D)	0	(D)	0	0
Other manufacturing industries	27,31,39	0	0	0	(D)	(D)	(D)	(D)	0	0	0
Nonmanufacturing		12	(D)	29	(D)	3,056	5	13	3	(D)	3,499
Transportation and utilities	40–42,44–49	(D)	(D)	0	(D)	(D)	(D)	13	(D)	0	(D)
Communications	48	0	0	0	0	(D)	0	0	0	0	(D)
Telephone communications	481	0	0	0	0	(D)	0	0	0	0	(D)
Other communications	482–484,489	0	0	0	0	0	0	0	0	0	0
Electric, gas, and sanitary services	49	(D)	(D)	0	(D)	(D)	(D)	13	(D)	0	(D)
Other transportation and utilities	40–42,44–47	0	0	0	0	0	0	0	0	0	0

See explanatory information and SOURCE at end of table.

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Industry and size of company	SIC code	Machinery: Engines and turbines 351	Machinery: Farm machinery and equipment 352	Machinery: Construction, mining, and materials handling machinery 353	Machinery: Metal-working machinery and equipment 354	Machinery: Office computing and accounting machines 357	Machinery: Other machinery except electrical 355-56 358-59	Electrical equipment: Electric transmission and distribution equipment 361	Electrical equipment: Electrical industrial apparatus 362	Electrical equipment: Radio and television receiving sets except communication types 365	Electrical equipment: Communications equipment 366
		[Dollars in millions]									
Distribution by industry:											
Trade	50–59	0	(D)	(D)	0	(D)	0	0	(D)	(D)	268
Finance, insurance, and real estate	60–65,67	0	0	0	0	0	0	0	0	0	0
Services	701,72,73, 75–81,83, 84,87,89	(D)	0	0	0	54	(D)	0	0	0	(D)
Business services	73	$0	$0	$0	$0	$14	$0	$0	$0	$0	$47
Computer and data processing services	737	0	0	0	0	14	0	0	0	0	47
Other business services	731–736,738	0	0	0	0	0	0	0	0	0	0
Health services	80	0	0	0	0	0	0	0	0	0	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	0	0	0	0	0	0	0	0	0	(D)
Other health services	802–805, 808–809	0	0	0	0	0	0	0	0	0	0
Engineering and management services	87	(D)	0	0	0	(D)	(D)	0	0	0	(D)
Engineering, architectural, and surveying	871	0	0	0	0	0	0	0	0	0	(D)
Research, development, and testing	873	(D)	0	0	0	(D)	(D)	0	0	0	0
Other engineering and management services	872,874	0	0	0	0	0	0	0	0	0	0
Other services	701,72,75–79, 81,83, 84, 89	(D)	0	0	0	(D)	0	0	0	0	(D)

See explanatory information and SOURCE at end of table.

Industry and size of company	SIC code	Machinery						Electrical equipment			
		Engines and turbines 351	Farm machinery and equipment 352	Construction, mining, and materials handling machinery 353	Metal-working machinery and equipment 354	Office computing and accounting machines 357	Other machinery except electrical 355-56 358-59	Electric transmission and distribution equipment 361	Electrical industrial apparatus 362	Radio and television receiving sets except communication types 365	Communications equipment 366
		[Dollars in millions]									
Distribution by industry:											
Other nonmanufacturing industries......	07-12,14,15,	0	0	(D)	0	0	(D)	0	0	0	0
Distribution by size of company: [Number of employees]											
Total..................	....	$1,660	$249	$482	$103	$4,392	$517	$166	$155	$90	$5,084
Fewer than 500..................	....	(D)	0	9	(D)	156	65	(D)	18	12	280
500 to 999..................	....	0	(D)	(D)	21	66	57	39	18	(D)	42
1,000 to 4,999..................	....	(D)	74	58	52	678	266	22	40	(D)	616
5,000 to 9,999..................	....	66	(D)	60	(D)	(D)	(D)	10	6	(D)	(D)
10,000 to 24,999..................	....	(D)	(D)	(D)	(D)	(D)	89	(D)	5	0	(D)
25,000 or more..................	....	1,220	(D)	331	0	2,880	(D)	(D)	68	0	3,845

See explanatory information and SOURCE at end of table.

Table A-[illegible] company, Federal, and other funds for applied R&D performance, by industry, size of company, and detailed product field: 1995

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Industry and size of company	SIC code	Electrical equipment		Transportation equipment				Professional and Scientific Instruments	
		Electronic components and accessories 367	Other electrical equipment and supplies 363-64, 368-69	Motor vehicles and equipment 371	Other transportation equipment 379	Aircraft and parts 372	Guided missiles and spacecraft 376	Scientific and mechanical measuring instruments 381-82	Optical, surgical photographic and other instruments 383-87
		[Dollars in millions]							
All Industries		$3,819	$733	$7,254	(D)	(D)	$788	$1,071	$958
Distribution by industry:									
Manufacturing		2,813	684	7,239	$168	(D)	(D)	1,049	907
Food, kindred, and tobacco products	20,21	0	0	0	0	$0	0	0	0
Textiles and apparel	22,23	0	0	0	0	0	0	0	0
Lumber, wood products, and furniture	24,25	(D)	(D)	(D)	0	(D)	0	(D)	0
Paper and allied products	26	0	0	0	0	0	0	(D)	(D)
Chemicals and allied products	28	69	(D)	(D)	(D)	0	0	(D)	243
Industrial chemicals	281–82,286	(D)	0	(D)	(D)	0	0	0	(D)
Drugs and medicines	283	0	(D)	0	0	0	0	(D)	(D)
Other chemicals	284–85,287–89	(D)	(D)	(D)	0	0	0	0	0
Petroleum refining and extraction	13,29	(D)	0	0	0	0	0	0	(D)
Rubber products	30	7	(D)	(D)	(D)	(D)	(D)	0	(D)
Stone, clay, and glass products	32	(D)	0	(D)	0	0	0	0	0
Primary metals	33	(D)	(D)	9	(D)	0	0	(D)	0
Ferrous metals and products	331–32, 3398–99	(D)	(D)	(D)	(D)	0	0	0	0
Nonferrous metals and products	333-36	0	0	(D)	0	0	0	(D)	0
Fabricated metal products	34	(D)	8	25	(D)	0	0	(D)	(D)
Machinery	35	77	(D)	122	(D)	(D)	(D)	21	(D)
Office, computing, and accounting machines	357	43	(D)	0	0	0	0	0	0
Other machinery, except electrical	351–56,358–59	34	53	122	(D)	(D)	(D)	21	(D)

See explanatory information and SOURCE at end of table.

[illegible] and detailed product field [illegible]

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Industry and size of company	SIC code	Electrical equipment		Transportation equipment				Professional and Scientific Instruments	
		Electronic components and accessories 367	Other electrical equipment and supplies 363-64, 368-69	Motor vehicles and equipment 371	Other transportation equipment 379	Aircraft and parts 372	Guided missiles and spacecraft 376	Scientific and mechanical measuring instruments 381-82	Optical, surgical photographic and other instruments 383-87
		[Dollars in millions]							
Distribution by industry:									
Electrical equipment	36	$1,850	$294	(D)	(D)	(D)	$0	$49	$23
Radio and TV receiving equipment	365	(D)	0	$0	$0	$0	0	0	(D)
Communication equipment	366	(D)	(D)	0	(D)	(D)	0	4	(D)
Electronic components	367	1,619	(D)	0	0	0	0	10	(D)
Other electrical equipment	361–64,369	178	279	(D)	(D)	(D)	0	35	(D)
Transportation equipment	37	(D)	(D)	(D)	26	(D)	(D)	(D)	(D)
Motor vehicles and motor vehicles equipment	371	(D)	(D)	(D)	0	(D)	(D)	0	0
Other transportation equipment	373–75,379	0	0	(D)	(D)	0	0	0	0
Aircraft and missiles	372,376	(D)	(D)	(D)	(D)	(D)	60	(D)	(D)
Professional and scientific instruments	38	258	94	(D)	(D)	(D)	(D)	807	535
Scientific and mechanical measuring instruments	381–82	214	(D)	(D)	0	(D)	(D)	(D)	42
Optical, surgical, photographic, and other instruments	384–87	44	(D)	0	(D)	0	0	(D)	493
Other manufacturing industries	27,31,39	7	(D)	0	(D)	0	0	0	0
Nonmanufacturing		1,006	49	16	(D)	(D)	(D)	22	52
Transportation and utilities	40–42,44–49	(D)	(D)	5	10	(D)	(D)	(D)	(D)
Communications	48	(D)	0	0	0	0	0	0	0
Telephone communications	481	(D)	0	0	0	0	0	0	0
Other communications	482–484,489	0	0	0	0	0	0	0	0
Electric, gas, and sanitary services	49	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Other transportation and utilities	40–42,44–47	0	(D)	(D)	(D)	0	0	0	0

See explanatory information and SOURCE at end of table.

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Industry and size of company	SIC code	Electrical equipment: Electronic components and accessories 367	Electrical equipment: Other electrical equipment and supplies 363-64, 368-69	Transportation equipment: Motor vehicles and equipment 371	Transportation equipment: Other transportation equipment 379	Transportation equipment: Aircraft and parts 372	Transportation equipment: Guided missiles and spacecraft 376	Professional and Scientific Instruments: Scientific and mechanical measuring instruments 381-82	Professional and Scientific Instruments: Optical, surgical photographic and other instruments 383-87
		[Dollars in millions]							
Distribution by industry:									
Trade	50–59	$724	$27	(D)	(D)	$0	$0	(D)	(D)
Finance, insurance, and real estate	60–65,67	0	0	$0	$0	0	0	$0	$0
Services	701,72,73, 75–81,83, 84,87,89	40	(D)	(D)	(D)	(D)	(D)	17	30
Business services	73	(D)	(D)	0	0	0	0	(D)	(D)
Computer and data processing services	737	(D)	0	0	0	0	0	(D)	(D)
Other business services	731–736,738	0	(D)	0	0	0	0	0	(D)
Health services	80	(D)	(D)	(D)	0	(D)	0	(D)	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	(D)	(D)	(D)	0	(D)	0	(D)	(D)
Other health services	802–805, 808–809	0	0	0	0	0	0	0	0
Engineering and management services	87	(D)	(D)	0	(D)	0	(D)	10	12
Engineering, architectural, and surveying	871	(D)	0	0	(D)	0	(D)	(D)	(D)
Research, development, and testing	873	(D)	(D)	0	0	0	0	(D)	(D)
Other engineering and management services	872,874	0	0	0	0	0	0	0	0
Other services	701,72,75–79, 81,83,84,89	(D)	0	0	0	0	0	0	0

See explanatory information and SOURCE at end of table.

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Industry and size of company	SIC code	Electrical equipment		Transportation equipment				Professional and Scientific Instruments	
		Electronic components and accessories 367	Other electrical equipment and supplies 363-64, 368-69	Motor vehicles and equipment 371	Other transportation equipment 379	Aircraft and parts 372	Guided missiles and spacecraft 376	Scientific and mechanical measuring instruments 381-82	Optical, surgical photographic and other instruments 383-87
		[Dollars in millions]							
Distribution by industry:									
Other nonmanufacturing industries	07–12,14,15, 161–162,17	(D)	$0	$0	(D)	$0	$0	$0	$0
Distribution by size of company: [Number of employees]									
Total		$3,819	733	7,254	(D)	1,430	788	1,071	958
Fewer than 500		304	77	(D)	(D)	17	(D)	151	130
500 to 999		309	50	30	$22	(D)	(D)	72	40
1,000 to 4,999		1,025	205	237	19	75	(D)	139	314
5,000 to 9,999		784	34	241	45	29	(D)	30	(D)
10,000 to 24,999		80	31	130	(D)	(D)	(D)	(D)	143
25,000 or more		1,317	336	(D)	(D)	(D)	(D)	(D)	(D)

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

NOTE: Imputation of R&D expenditures by product field was eliminated beginning in 1985. This table, therefore, contains only data reported by survey respondents who received form RD-1L. See table A-34 for coverage ratios showing the percentage of each industry's applied research and development funds that respondents distributed by product field.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Projected 1996
		[Dollars in millions]											
All industries		$3,954	$3,358	$3,576	$3,706	$3,789	$4,004	$4,615	$3,225	$2,747	$2,549	$2,330	$2,184
Distribution by industry:													
Manufacturing		3,616	3,030	3,143	3,155	3,175	3,274	3,918	2,631	2,111	1,740	1,797	1,763
Food, kindred, and tobacco products	20,21	2	2	(S)	(3)	(D)	(D)	(D)	(D)	0	(D)	(D)	0
Textiles and apparel	22,23	1	(D)	(D)	(D)	(D)	(D)	0	0	0	0	0	0
Lumber, wood products, and furniture	24,25	3	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Paper and allied products	26	(D)	(D)	1	1	(D)	(D)	(D)	1	(D)	(D)	(D)	(D)
Chemicals and allied products	28	162	(S)	(S)	(S)	111	417	(D)	72	(D)	(D)	(D)	(D)
Industrial chemicals	281–82,286	(D)	(D)	(D)	(D)	108	414	(D)	66	(D)	(D)	(D)	(D)
Drugs and medicines	283	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	0	0	0	0
Other chemicals	284–85,287–89	2	2	2	4	(D)	(D)	(D)	(D)	0	(D)	2	2
Petroleum refining and extraction	13,29	1,199	999	914	1,056	1,128	1,177	1,416	1,150	798	(D)	(D)	(D)
Rubber products	30	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	2	(D)	(D)	(D)
Stone, clay, and glass products	32	(D)	(D)	1	(D)	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Primary metals	33	(S)	74	18	21	(D)	(D)	26	3	17	68	(D)	(D)
Ferrous metals and products	331–32,3398–99	26	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Nonferrous metals and products	333–36	(S)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Fabricated metal products	34	8	(D)	(D)	(D)	14	49	2	(D)	(D)	1	(D)	(D)
Machinery	35	240	261	(D)	244	260	254	(S)	154	(D)	(D)	(D)	(D)
Office, computing, and accounting machines	357	12	(D)	(D)	(D)	(D)	0	(D)	(D)	0	0	0	0
Other machinery, except electrical	351–56,358–59	228	(D)	(D)	(D)	(D)	235	(D)	(D)	(D)	(D)	(D)	(D)
Electrical equipment	36	733	(D)	578	680	647	627	(D)	(D)	(D)	(D)	(D)	(D)
Radio and TV receiving equipment	365	0	0	0	0	0	0	0	0	0	0	0	0
Communication equipment	366	115	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	12	(D)	(D)
Electronic components	367	(D)	(D)	(D)	(D)	(D)	(D)	(D)	8	14	(D)	(D)	(D)
Other electrical equipment	361–64,369	(D)	(D)	(S)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)

See explanatory information and SOURCE at end of table.

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Projected 1996
		[Dollars in millions]											
Distribution by industry:													
Transportation equipment	37	(S)	(S)	(S)	(D)	$847	$863	(S)	(D)	(D)	(D)	(D)	(D)
Motor vehicles and motor vehicles equipment	371	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Other transportation equipment	373–75,379	(D)	(D)	(D)	(D)	(D)	(D)	$0	$0	$0	$0	$0	$0
Aircraft and missiles	372,376	$681	$537	$754	$652	577	626	(D)	478	381	(D)	(D)	(D)
Professional and scientific instruments	38	(D)	(D)	17	16	12	11	(S)	(S)	(D)	(D)	(D)	0
Scientific and mechanical measuring instruments	381–82	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	0	(D)	0	0
Optical, surgical, photographic, and other instruments	384–87	(D)	0	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	0
Other manufacturing industries	27,31,39	0	0	0	0	(D)	(D)	(D)	0	0	0	(D)	0
Nonmanufacturing 1/		338	328	433	551	614	730	697	594	636	809	533	421
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	106	100
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	106	(D)
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	(D)
Trade	50–59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0
Services	701,72,73, 75–81,83, 84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	218 (S)	94
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0

See explanatory information and SOURCE at end of table.

Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Projected 1996
		[Dollars in millions]											
Distribution by industry:													
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Other health services	802–805, 808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	$0	$0
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	93	80
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0
Other services	701,72,75–79, 81,83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0
Other nonmanufacturing industries	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)

See explanatory information and SOURCE at end of table.

Table A-[illegible]. Total (company, Federal, and other) funds for industrial energy R&D performance, by industry and size of company: 1985–95 and projected 1996

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Projected 1996
		[Dollars in millions]											
Distribution by size of company: [Number of employees]													
Total		NA	NA	NA	NA	NA	NA	NA	NA	NA	$2,549	$2,330	$2,184
Fewer than 500		NA	NA	NA	NA	NA	NA	NA	NA	NA	28	39	39
500 to 999		NA	NA	NA	NA	NA	NA	NA	NA	NA	86	22	24
1,000 to 4,999		NA	NA	NA	NA	NA	NA	NA	NA	NA	76	45	24
5,000 to 9,999		NA	NA	NA	NA	NA	NA	NA	NA	NA	48	48	47
10,000 to 24,999		NA	NA	NA	NA	NA	NA	NA	NA	NA	782	749	640
25,000 or more		NA	NA	NA	NA	NA	NA	NA	NA	NA	1,529	1,427	1,410

1/ Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
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NOTES: Detailed data for 1985 and 1987 were estimated on the basis of (a) data actually reported in those years, (b) revised data for those years on reported on the 1986 and 1988 survey forms, and (c) adjustments to a new sample design in 1987.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

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SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible] funds for industrial energy R&D performance, by selected industry: 1985-95 and projected 1996

Page 1 of 1

Industry	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Projected 1996
		[Dollars in millions]											
Total		$2,537	$2,167	$2,410	$2,317	$2,418	$2,558	$2,691	$2,084	$1,694	$1,660	$1,360	$1,306
Chemicals and allied products	28	(D)	(D)	(D)	59	97	412	(D)	(D)	(D)	(D)	35	35
Petroleum refining and extraction	13,29	1,145	957	911	1,050	1,124	1,174	1,409	1,143	790	596	646	617
Machinery	35	(D)	(D)	(D)	229	246	220	(S)	146	177	270	108	110
Electrical equipment	36	71	(D)	(D)	123	92	90	101	159	114	174	(D)	(D)
Aircraft and missiles	372,376	0 (264)	0 (236)	(D)	0 (211)	0 (160)	0 (199)	(D)	(D)	(D)	(D)	(D)	(D)
All other manufacturing industries		610	497	564	450	451	173	(S)	41	24	73	30	33
Nonmanufacturing industries	07–10,12–17, 40–42,44–49, 50–59,60–65, 67,701,73, 75–76,78–79, 81–84,83–84, 87,89	84	(D)	170	195	248	290	274	281	403	449	398	372

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[illegible]

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Industry	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Projected 1996
		[Dollars in millions]											
Total		$1,417	$1,191	$1,166	$1,389	$1,371	$1,446	$1,924	$1,141	$1,053	$888	$970	$878
Chemicals and allied products	28	(D)	(D)	(D)	13	14	5	(D)	(D)	(D)	(D)	(D)	(D)
Petroleum refining and extraction	13,29	54	42	3	6	4	3	6	7	8	(D)	(D)	(D)
Machinery	35	(D)	(D)	(D)	15	14	34	(S)	(D)	(D)	(D)	(D)	(D)
Electrical equipment	36	662	(D)	(D)	557	555	537	(D)	(D)	(D)	(D)	(D)	(D)
Aircraft and missiles	372,376	417	302	(D)	441	417	427	(D)	(D)	(D)	(D)	(D)	(D)
All other manufacturing industries		13	4	5	1	0	2	1	2	2	207	1	1
Nonmanufacturing industries	07–10,12–17, 40–42,44–49, 50–59,60–65,67, 701,73,75–76, 76,78–79,80–81, 83–84,87,89	254	(D)	263	356	367	438	423	313	233	359	134 (S)	49

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SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[redacted]

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Primary energy source	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Projected 1996
	[Dollars in millions]											
Total	$3,954	$3,358	$3,576	$3,706	$3,789	$4,004	$4,615	$3,225	$2,747	$2,549	$2,330	$2,184
Fossil fuels	1,876	1,476	1,548	1,583	1,652	1,879	2,128	1,498	1,082	966	811	838
Oil	1,395	NA	(S)	NA	(S)	NA	(S)	NA	693	NA	608	627
Gas	189	NA	191	NA	(S)	NA	(S)	NA	215	NA	124	104
Shale	125	NA	11	NA	77	NA	(S)	NA	(D)	NA	0	0
Coal	150	NA	46	NA	(S)	NA	(S)	NA	97	NA	62	(D)
Synthetic fossil fuels	111	NA	23	NA	17	NA	(S)	NA	23	NA	(D)	(D)
Mining	8	NA	3	NA	(S)	NA	(S)	NA	(D)	NA	3	(D)
Other	31	NA	(S)	NA	(S)	NA	(S)	NA	(D)	NA	(D)	(D)
Other fossil fuels	17	NA	51	NA	(S)	NA	58	NA	(D)	NA	17	(D)
Nuclear	1,212	979	926	1,098	919	973	1,139	849	818	(D)	255	160
Fission	1,062	NA	859	NA	856	NA	1,134	NA	(D)	NA	(D)	(D)
Fusion	150	NA	(S)	NA	63	NA	5	NA	(D)	NA	(D)	(D)
Total geothermal, solar, and conservation and utilization	471	504	421	492	612	(D)	886	608	442	469	380	353
Geothermal	54	NA	48	NA	(D)	NA	(S)	NA	90	NA	(D)	(D)
Solar	96	NA	95	NA	(D)	NA	(S)	NA	59	NA	(D)	(D)
Conservation and utilization	321	NA	281	NA	391	NA	(S)	NA	293	NA	219	201
All other energy	395	399	(S)	533	606	681	507	271	404	(D)	684	833

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Primary energy source	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Projected 1996
	[Dollars in millions]											
Total	$2,537	$2,167	$2,410	$2,317	$2,418	$2,558	$2,691	$2,084	$1,694	$1,660	$1,360	$1,306
Fossil fuels	1,797	(D)	(D)	1,519	1,485	1,704	1,869	1,414	1,003	874	787	816
Oil	1,381	NA	(S)	NA	(S)	NA	(S)	NA	(D)	NA	(D)	623
Gas	(D)	NA	(S)	NA	(S)	NA	(S)	NA	210	NA	(D)	(D)
Shale	124	NA	(S)	NA	(S)	NA	(S)	NA	0	NA	0	0
Coal	(S)	NA	29	NA	(S)	NA	(S)	NA	57	NA	43	73
Synthetic fossil fuels	91	NA	(S)	NA	(D)	NA	(S)	NA	(D)	NA	(D)	(D)
Mining	8	NA	(D)	NA	(D)	NA	(D)	NA	0	NA	3	(D)
Other	(S)	NA	(D)	NA	(S)	NA	(D)	NA	(D)	NA	(D)	(D)
Other fossil fuels	17	NA	(S)	NA	(S)	NA	(S)	NA	(D)	NA	(D)	(D)
Nuclear	150	91	109	117	39	72	46	72	58	(D)	(D)	(D)
Fission	135	NA	82	NA	27	NA	45	NA	(D)	NA	63	(D)
Fusion	15	NA	(S)	NA	12	NA	1	NA	(D)	NA	(D)	(D)
Total geothermal, solar, and conservation and utilization	313	(D)	(D)	314	416	278	478	474	307	300	245	226
Geothermal	27	NA	(D)	NA	(D)	NA	(S)	NA	(D)	NA	(D)	(D)
Solar	51	NA	41	NA	(D)	NA	(S)	NA	(D)	NA	14	(D)
Conservation and utilization	235	NA	(D)	NA	384	NA	(S)	NA	203	NA	(D)	(D)
All other energy	277	(D)	(D)	367	478	504	298	124	325	(D)	(D)	(D)

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Primary energy source	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Projected 1996
	[Dollars in millions]											
Total	$1,417	$1,191	$1,166	$1,365	$1,265	$1,418	$1,924	$1,141	$1,053	$888	$970	$878
Fossil fuels	78	(D)	(D)	63	(D)	(D)	(S)	84	79	92	24	22
Oil	13	NA	(S)	NA	(S)	NA	(S)	NA	(D)	NA	(D)	4
Gas	(D)	NA	(D)	NA	(S)	NA	(S)	NA	5	NA	(D)	(D)
Shale	1	NA	(D)	NA	(S)	NA	(S)	NA	(D)	NA	0	0
Coal	(S)	NA	17	NA	(S)	NA	(S)	NA	40	NA	19	(D)
Synthetic fossil fuels	20	NA	8	NA	(D)	NA	(S)	NA	(D)	NA	(D)	(D)
Mining	0	NA	(D)	NA	(D)	NA	(D)	NA	(D)	NA	0	0
Other	(S)	NA	(D)	NA	(S)	NA	(D)	NA	(S)	NA	(D)	(D)
Other fossil fuels	0	NA	1	NA	(S)	NA	(S)	NA	(D)	NA	(D)	(D)
Nuclear	1,063	888	817	979	859	885	1,093	776	759	536	(D)	(D)
Fission	928	NA	777	NA	809	NA	1,089	NA	(D)	NA	(D)	(D)
Fusion	135	NA	(S)	NA	50	NA	4	NA	(D)	NA	(D)	(D)
Total geothermal, solar, and conservation and utilization	158	(D)	(D)	178	(D)	(D)	(S)	135	136	169	135	127
Geothermal	26	NA	(D)	NA	(D)	NA	11	NA	(D)	NA	(D)	(D)
Solar	45	NA	37	NA	(D)	NA	38	NA	(D)	NA	(D)	(D)
Conservation and utilization	87	NA	(D)	NA	(D)	NA	(S)	NA	(S)	NA	(D)	(D)
All other energy	118	(D)	(D)	165	(D)	174	(S)	146	79	91	(D)	(D)

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Industry	SIC code	Total		Size of company											
				Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Energy	Total	Energy	Total	Energy	Total	Energy	Total	Energy	Total	Energy	Total	Energy
All Industries		33,314	110	30,284	13	1,235	8	1,217	28	274	14	172	31	131	16
Manufacturing		17,537	72	15,400	7	794	4	955	21	179	7	131	21	78	12
Food, kindred, and tobacco products	20,21	780	1	629	1	45	0	72	0	12	0	12	0	10	0
Textiles and apparel	22,23	623	0	527	0	41	0	38	0	6	0	9	0	2	0
Lumber, wood products, and furniture	24,25	690	1	610	0	31	0	40	1	7	0	1	0	1	0
Paper and allied products	26	239	3	160	0	17	0	41	1	7	1	9	0	6	1
Chemicals and allied products	28	1,600	10	1,386	0	59	0	89	4	39	1	19	3	8	2
Industrial chemicals	281–82,286	386	5	304	0	36	0	29	1	5	0	9	2	3	2
Drugs and medicines	283	339	0	288	0	10	0	26	0	3	0	8	0	4	0
Other chemicals	284–85,287–89	875	5	794	0	13	0	34	3	31	1	2	1	1	0
Petroleum refining and extraction	13,29	54	16	28	2	1	1	10	2	2	1	9	7	4	3
Rubber products	30	920	3	769	0	75	0	61	3	8	0	4	0	2	0
Stone, clay, and glass products	32	399	1	344	0	26	0	22	1	3	0	4	0	0	0
Primary metals	33	258	7	150	0	36	1	50	1	14	2	5	2	3	1
Ferrous metals and products	331–32,3398–99	73	4	17	0	11	0	30	0	12	2	2	1	1	1
Nonferrous metals and products	333–36	185	3	132	0	25	1	20	1	2	0	3	1	2	0
Fabricated metal products	34	1,392	1	1,233	0	68	0	69	1	8	0	14	0	0	0
Machinery	35	3,937	12	3,613	2	131	0	150	3	22	1	15	5	6	1
Office, computing, and accounting machines	357	426	0	377	0	15	0	25	0	6	0	2	0	1	0
Other machinery, except electrical	351–56,358–59	3,511	12	3,236	2	116	0	125	3	16	1	13	5	5	1
Electrical equipment	36	2,475	10	2,195	2	111	2	133	3	15	0	9	2	12	1
Radio and TV receiving equipment	365	84	0	75	0	3	0	6	0	0	0	0	0	0	0
Communication equipment	366	466	1	404	0	32	0	24	1	2	0	2	0	2	0
Electronic components	367	893	2	786	1	39	1	56	0	7	0	2	0	3	0
Other electrical equipment	361–64,369	1,032	7	930	1	37	1	47	2	6	0	5	2	7	1

See explanatory information and SOURCE at end of table.

Table A-4. Number of companies performing energy R&D and total number of R&D-performing companies, by industry and size of company: [illegible]

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Industry	SIC code	Total		Size of company											
				Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Energy	Total	Energy	Total	Energy	Total	Energy	Total	Energy	Total	Energy	Total	Energy
Transportation equipment	37	599	5	462	0	35	0	63	0	15	1	9	1	15	3
Motor vehicles and motor vehicles equipment	371	483	1	390	0	29	0	46	0	9	0	5	1	4	0
Other transportation equipment	373–75,379	31	0	14	0	3	0	9	0	0	0	3	0	2	0
Aircraft and missiles	372,376	85	4	58	0	3	0	8	0	6	1	1	0	9	3
Professional and scientific instruments	38	2,663	1	2,489	0	89	0	68	1	9	0	2	0	6	0
Scientific and mechanical measuring instruments	381–82	1,731	0	1,667	0	33	0	23	0	3	0	1	0	4	0
Optical, surgical, photographic, and other instruments	384–87	933	1	823	0	56	0	45	1	6	0	1	0	2	0
Other manufacturing industries	27,31,39	908	1	805	0	30	0	48	0	11	0	10	1	3	0
Nonmanufacturing		15,777	38	14,884	6	441	4	262	7	95	7	41	10	53	4
Transportation and utilities	40–42,44–49	249	20	123	0	2	0	70	6	18	5	15	8	21	1
Communications	48	99	0	58	0	2	0	27	0	1	0	0	0	11	0
Telephone communications	481	63	0	25	0	0	0	25	0	1	0	0	0	11	0
Other communications	482–484,489	37	0	32	0	2	0	2	0	0	0	0	0	0	0
Electric, gas, and sanitary services	49	132	20	64	0	0	0	38	6	16	5	13	8	2	1
Other transportation and utilities	40–42,44–47	18	0	2	0	0	0	5	0	1	0	2	0	8	0
Trade	50–59	5,727	3	5,593	0	22	1	52	0	40	1	5	0	15	1
Finance, insurance, and real estate	60–65,67	169	0	74	0	57	0	15	0	16	0	2	0	5	0
Services	701,72 73,75–81,83,84,87,89	8,286	11	8,034	4	100	3	109	0	17	1	16	2	10	1
Business services	73	4,266	0	4,106	0	68	0	68	0	10	0	7	0	7	0
Computer and data processing services	737	3,557	0	3,429	0	56	0	57	0	7	0	5	0	3	0
Other business services	731–736,738	709	0	677	0	12	0	11	0	3	0	2	0	4	0

See explanatory information and SOURCE at end of table.

Table A-42. Number of companies performing energy R&D and total number of R&D-performing companies, by industry and size of company: 1995

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Industry	SIC code	Total		Size of company											
				Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Energy	Total	Energy	Total	Energy	Total	Energy	Total	Energy	Total	Energy	Total	Energy
Health services	80	1,055	1	1,036	0	6	0	9	0	0	0	3	0	1	1
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	745	1	730	0	6	0	5	0	0	0	2	0	1	1
Other health services	802–805, 808–809	310	0	306	0	0	0	3	0	0	0	1	0	0	0
Engineering and management services	87	2,666	10	2,613	4	22	3	24	0	3	1	3	2	1	0
Engineering, architectural, and surveying	871	1,052	6	1,013	2	15	2	20	0	2	1	1	1	1	0
Research, development, and testing	873	1,333	4	1,324	2	6	1	2	0	0	0	1	1	0	0
Other engineering and management services	872,874	281	0	276	0	1	0	2	0	1	0	1	0	0	0
Other services	701,72,75–79, 81,83,84,89	300	0	279	0	4	0	8	0	4	0	3	0	1	0
Other nonmanufacturing industries	07–12,14,15, 161–162,17	1,344	4	1,059	2	259	0	16	1	5	0	3	0	2	1

KEY: Energy and pollution-abatement R&D data are collected only on form RD-1L, which is sent to larger R&D-performing companies for odd-numbered survey years (see the technical notes in section B of this report for an explanation of the various survey questionnaires). Consequently, the universe of companies that perform energy or pollution-abatement R&D may not be represented by the statistics in this table.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible] R&D performance, by industry and size of company: 1985–95 and projected 1996

Page 1 of 3

Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Projected 1996
		[Dollars in millions]											
All Industries		(S)	(S)	(S)	(S)	$1,372	$1,044	$1,326	$638	$845	$931	$892	$627
Distribution by industry:													
Manufacturing		(S)	(S)	(S)	(S)	1,372	1,044	1,186	583	769	739	594	513
Food, kindred, and tobacco products	20,21	$1	$1	$1	$1	3	2	4	2	(S)	4	4	(D)
Textiles and apparel	22,23	2/	(D)	2/	(S)	2/	2/	(S)	(S)	0	(D)	(D)	(D)
Lumber, wood products, and furniture	24,25	1	(D)	(D)	(D)	(D)	(D)	(D)	1	1	2	(D)	(D)
Paper and allied products	26	8	7	7	9	19	16	13	10	14	15	10	7
Chemicals and allied products	28	(S)	168	117	136	178	163	188	127	(D)	157	101	88
Industrial chemicals	281–82,286	(S)	(S)	(D)	117	61	(D)	(S)	87	135	134	93	80
Drugs and medicines	283	(D)	(D)	(D)	(D)	(D)	(D)	16	16	(D)	(D)	(D)	(D)
Other chemicals	284–85,287–89	14	(D)	12	(D)	(D)	67	26	24	(D)	(D)	(D)	(D)
Petroleum refining and extraction	13,29	60	63	51	60	75	72	111	107	111	102	34	43
Rubber products	30	(D)	(D)	(D)	(S)	1	1	1	1	(D)	2	2	(D)
Stone, clay, and glass products	32	3	4	(D)	(D)	(D)	(D)	(D)	39	44	47	(D)	(D)
Primary metals	33	20	8	5	9	10	8	(S)	4	3	(D)	19	11
Ferrous metals and products	331–32,3398–99	11	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Nonferrous metals and products	333–36	9	6	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Fabricated metal products	34	6	(D)	(D)	(D)	1	2	5	7	14	13	11	11
Machinery	35	26	33	38	46	111	116	(S)	91	186	(D)	222	194
Office, computing, and accounting machines	357	0	0	0	0	0	0	(D)	0	(D)	(D)	0	0
Other machinery, except electrical	351–56,358–59	26	33	38	46	111	116	(D)	91	(D)	(D)	222	194
Electrical equipment	36	(D)	5	(D)	(D)	9	11	(D)	(D)	(D)	33	(D)	(D)
Radio and TV receiving equipment	365	0	0	0	0	0	0	0	0	0	0	0	0
Communication equipment	366	1	1	(D)	(D)	7	8	(D)	(D)	(D)	(D)	(D)	(D)
Electronic components	367	2/	(D)	(D)	0	(D)	2	1	(D)	3	3	(D)	(D)
Other electrical equipment	361–64,369	(D)	(D)	(D)	(D)	(D)	1	(D)	(D)	(D)	(D)	(D)	(D)
Transportation equipment	37	(S)	(S)	(S)	(S)	(S)	(S)	(S)	145	174	110	109	78
Motor vehicles and motor vehicles equipment	371	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	74	80	(D)	(D)

See explanatory information and SOURCE at end of table.

[illegible] for industrial [illegible] by industry and size of company: 1985–95 and projected 1996

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Projected 1996
		[Dollars in millions]											
Distribution by industry:													
Other transportation equipment	373–75,379	(D)	(D)	(D)	(D)	(D)	(D)	(D)	0	(D)	(D)	0	0
Aircraft and missiles	372,376	(S)	87	123	103	120	195	114	(D)	(D)	(D)	(D)	(D)
Professional and scientific instruments	38	2	(D)	(D)	3	(D)	4	10	6	8	(D)	13	8
Scientific and mechanical measuring instruments	381–82	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	8 (S)	(D)
Optical, surgical, photographic, and other instruments	384–87	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	6	5	(D)
Other manufacturing industries	27,31,39	(S)	0	(D)	(D)	1	(1)	(D)	(D)	(D)	(D)	0	0
Nonmanufacturing 1/		118	80	113	(S)	(S)	(S)	140	55	76	193	299 (S)	113
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	91	63
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	91	(D)
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	(D)
Trade	50–59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0
Services	701,72,73,75–81,83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	20
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Other health services	802–805,808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0

See explanatory information and SOURCE at end of table.

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Projected 1996
		[Dollars in millions]											
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0
Other services	701,72,75–79, 81,83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0
Other nonmanufacturing industries	07–12,14,15,	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1	(D)
Distribution and size of company: [Number of employees]	161–162,17												
Total		NA	NA	NA	NA	NA	NA	NA	NA	NA	931	892	627
Fewer than 500		NA	NA	NA	NA	NA	NA	NA	NA	NA	13	23	18
500 to 999		NA	NA	NA	NA	NA	NA	NA	NA	NA	2	12	12
1,000 to 4,999		NA	NA	NA	NA	NA	NA	NA	NA	NA	74	64	47
5,000 to 9,999		NA	NA	NA	NA	NA	NA	NA	NA	NA	60	75	66
10,000 to 24,999		NA	NA	NA	NA	NA	NA	NA	NA	NA	307	374	212
25,000 or more		NA	NA	NA	NA	NA	NA	NA	NA	NA	475	344	271

1/ Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

2/ Less than $0.5 million.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.
NA = Not available.

NOTES: Detailed data for 1985 and 1987 were estimated on the basis of (a) data actually reported in those years, (b) revised data for those years reported on the 1986 and 1988 survey forms, and (c) adjustments to a new sample design in 1987.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

Energy and pollution-abatement R&D data are collected only on form RD-1L, which is sent to larger R&D-performing companies for odd-numbered survey years (see the technical notes in section B of this report for an explanation of the various survey questionnaires). Consequently, the universe of companies that perform energy or pollution-abatement R&D may not be represented by the statistics in this table.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[redacted]

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Industry	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Projected 1996
		[Dollars in millions]											
Total		(S)	(S)	(S)	(S)	(S)	$955	(S)	$545	$735	$734	$830	$802
Chemicals and allied products	28	(S)	(D)	(D)	(D)	(D)	163	188	126	149	153	101	88
Petroleum refining and extraction	13,29	$61	$83	$51	$80	(D)	(D)	110	106	111	102	34	43
Machinery	35	(D)	33	38	46	(D)	116	(S)	90	186	(D)	222	194
Electrical equipment	36	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	33	(D)	(D)
Aircraft and missiles	372,376	(D)	(D)	62	(D)	$70	(D)	51	(D)	28	(D)	(D)	(D)
All other manufacturing industries		(D)	676	(D)	(D)	737	406	(S)	84	(D)	192	184	141
Nonmanufacturing industries 1/	07–10,12–17, 40–42,44–49 50–59,60–65,67, 701,73,75–76, 78–79,80–81, 83–84,87,89	(D)	(D)	(D)	(D)	58	(D)	(D)	38	44	56	241 (S)	92

1/ Nonmanufacturing industries for 1990 and prior years included the following SICs only: 10–11, 14–17, 40–42, 44–51, 53–54, 56, 60, 62–63, 72–73, 78, 806–07, and 87.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

NOTES: Detailed data for 1985 and 1987 were estimated on the basis of (a) data actually reported in those years, (b) revised data for those years on reported on the 1986 and 1988 survey forms, and (c) adjustments to a new sample design in 1987.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

Energy and pollution-abatement R&D data are collected only on form RD-1L, which is sent to larger R&D-performing companies for odd-numbered survey years (see the technical notes in section B of this report for an explanation of the various survey questionnaires). Consequently, the universe of companies that perform energy or pollution-abatement R&D may not be represented by the statistics in this table.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

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Industry	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Projected 1996
		[Dollars in millions]											
Total		$169	$148	$186	$191	(S)	$89	$92	$93	$110	$128	(D)	$24
Chemicals and allied products	28	(D)	(D)	(D)	(D)	(D)	0	0	(D)	(D)	(D)	$0	0
Petroleum refining and extraction	13,29	0	0	0	0	(D)	(D)	(D)	(D)	0	0	0	0
Machinery	35	(D)	0	0	0	(D)	0	0	(D)	0	(D)	0	0
Electrical equipment	36	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Aircraft and missiles	372376	(D)	(D)	61	(D)	$50	(D)	(D)	(D)	(D)	(D)	(D)	(D)
All other manufacturing industries		(D)	(D)	(D)	0	0	(D)	(D)	2	0	54	1	1
Nonmanufacturing industries 1/	07–10,12–17, 40–42,44–49, 50–59,60–65,67, 701,73,75–76, 78–79,80–81, 83–84,87,89	(D)	(D)	(D)	(D)	(D)	(D)	(D)	18	(S)	(D)	(D)	21

1/ Nonmanufacturing industries for 1990 and prior years included the following SICs only: 10–11, 14–17, 40–42, 44–51, 53–54, 56, 60, 62–63, 72–73, 78, 806–07, and 87.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

NOTES: Detailed data for 1985 and 1987 were estimated on the basis of (a) data actually reported in those years, (b) revised data for those years on reported on the 1986 and 1988 survey forms, and (c) adjustments to a new sample design in 1987.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

Energy and pollution-abatement R&D data are collected only on form RD-1L, which is sent to larger R&D-performing companies for odd-numbered survey years (see the technical notes in section B of this report for an explanation of the various survey questionnaires). Consequently, the universe of companies that perform energy or pollution-abatement R&D may not be represented by the statistics in this table.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

Table A-46. Total (company, Federal, and other) funds for industrial pollution-abatement R&D performance, by type of pollution: 1985-95 and projected 1996

Page 1 of 1

Type of pollution	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Projected 1996
	[Dollars in millions]											
Total	(S)	(S)	(S)	(S)	(S)	$1,044	(S)	$638	$845	$931	(D)	$627
Air	(S)	NA	(S)	NA	(S)	NA	(S)	NA	489	NA	(D)	(D)
Automotive emission	(D)	NA	(S)	NA	(S)	NA	(S)	NA	127	NA	$122	94
Electric power plant emissions	$12	NA	$16	NA	$36	NA	(S)	NA	(D)	NA	(D)	(D)
All other	(D)	NA	(S)	NA	(S)	NA	(S)	NA	(D)	NA	(D)	(D)
Water	(S)	NA	(S)	NA	(S)	NA	(S)	NA	87	NA	68	53
Solid waste	(S)	NA	206	NA	(S)	NA	(S)	NA	124	NA	59	42
Other	108	NA	90	NA	85	NA	(S)	NA	145	NA	(D)	(D)

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.
NA = Not available.

NOTES: Detailed data for 1985 and 1987 were estimated on the basis of (a) data actually reported in those years, (b) revised data for those years on reported on the 1986 and 1988 survey forms, and (c) adjustments to a new sample design in 1987.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

Energy and pollution-abatement R&D data are collected only on form RD-1L, which is sent to larger R&D-performing companies for odd-numbered survey years (see the technical notes in section B of this report for an explanation of the various survey questionnaires). Consequently, the universe of companies that perform energy or pollution-abatement R&D may not be represented by the statistics in this table.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible]

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Type of pollution	1994			1995			1996 (Projected)		
	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
	[Dollars in millions]								
Total	$931	$198	$734	(D)	(D)	$830	$627	$37	$589
Air	NA	NA	NA	(D)	(D)	583	(D)	(D)	415
Automotive emission	NA	NA	NA	$122	$0	122	94	0	94
Electric power plant emissions	NA	NA	NA	(D)	(D)	209	(D)	(D)	69
All other	NA	NA	NA	(D)	(D)	251	(D)	(D)	252
Water	NA	NA	NA	68	1	67	53	0	52
Solid waste	NA	NA	NA	59	4	55	42	5	37
Other	NA	NA	NA	(D)	(D)	125	(D)	(D)	85

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
NA = Not available.

NOTE: Energy and pollution-abatement R&D data are collected only on form RD-1L, which is sent to larger R&D-performing companies for odd-numbered survey years (see the technical notes in section B of this report for an explanation of the various survey questionnaires). Consequently, the universe of companies that perform energy or pollution-abatement R&D may not be represented by the statistics in this table.

SOURCE: National Science Foundation, Division of Science Recources Studies, Survey of Industrial Research and Development: 1995

[illegible] funds for industrial R&D performance in selected [illegible]

Page 1 of 3

Area	1976	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995
	[Dollars in millions]										
United States, total	$26,997	$29,825	$38,226	$51,810	$65,268	$84,239	$92,155	$102,055	$116,952	$117,400	$132,103
Northeast	8,096	8,687	10,296	14,270	18,957	24,837	24,549	27,998	35,170	33,785	35,030
New England	2,147	2,400	3,003	3,855	4,680	7,456	7,965	8,828	(S)	10,092	12,848
Maine	21	24	40	(T)	(T)	(D)	39	33	(S)	(D)	286
New Hampshire	(T)	(T)	(T)	(T)	(T)	(D)	90	(D)	(D)	248	472
Vermont	(T)	(T)	(T)	(T)	(T)	(D)	236	(D)	(D)	(D)	248
Massachusetts	1,156	1,349	1,690	1,907	2,466	4,495	5,255	5,851	(S)	6,952	7,416
Rhode Island	22	24	49	87	171	213	224	140	174	176	520
Connecticut	815	876	985	1,514	1,682	2,129	2,121	2,421	1,756	2,373	3,906
Middle Atlantic	5,949	6,287	7,293	10,415	14,277	17,381	16,583	19,170	25,553	23,693	22,182
New York	2,418	2,542	2,959	4,057	5,951	7,561	6,276	8,107	9,457	8,820	8,651
New Jersey	1,717	1,900	2,191	3,355	4,364	5,975	5,876	6,410	8,933	8,162	8,200
Pennsylvania	1,814	1,845	2,143	3,003	3,963	3,844	4,430	4,653	(S)	6,711	5,331
North Central	6,574	7,777	10,013	12,692	15,245	19,390	23,180	24,725	28,933	28,646	33,004
East North Central	5,390	6,270	8,065	9,742	11,967	15,254	17,635	19,395	24,017	23,830	26,592
Ohio	1,183	1,323	1,635	1,781	2,282	3,067	3,415	3,964	5,406	5,144	4,001
Indiana	469	541	723	1,054	(T)	(D)	1,860	1,823	2,274	2,177	2,721 (S)
Illinois	1,226	1,360	1,673	2,077	2,291	(D)	4,099	4,068	5,750	5,242	5,776 (S)
Michigan	2,249	2,750	3,614	4,272	5,716	6,436	7,095	8,506	9,283	9,924	12,388
Wisconsin	263	296	420	558	(T)	728	1,165	1,035	1,304	1,343	1,706
West North Central	1,184	1,507	1,948	2,950	3,278	4,136	5,545	5,331	4,916	4,816	6,412 (S)
Minnesota	551	602	802	1,180	1,814	(D)	2,145	2,075	2,070	2,458	2,636 (S)
Iowa	144	173	150	393	287	(D)	328	365	527	533	998
Missouri	398	630	746	1,137	(T)	(D)	1,823	2,391	(S)	1,375 (S)	2,028 (S)
North Dakota	(T)	(T)	(T)	(T)	(T)	10	57	(S)	(S)	9	12
South Dakota	(T)	(T)	(T)	(T)	(T)	(S)	4	4	6	22	19
Nebraska	13	14	15	28	26	(D)	59	64	67	128	150
Kansas	76	84	216	211	293	(D)	1,128	406	(S)	292 (S)	569

See explanatory information and SOURCE at end of table.

A-41. Total (company, Federal, and other) funds for industrial R&D performance in selected years by state: 1976-95

Page 2 of 3

Area	1976	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995
	[Dollars in millions]										
South	$3,442	$3,691	$4,496	$6,987	$9,292	$12,948	$15,938	$15,389	$17,696	$18,026	$21,833
South Atlantic	1,847	2,012	2,592	4,012	5,000	7,338	8,811	8,136	(S)	10,692	12,885
Delaware	(T)	(T)	(T)	(T)	(T)	(D)	(D)	(D)	(D)	1,181 (S)	1,077 (S)
Maryland	452	382	424	(T)	(T)	1,548	1,292	1,093	1,376	2,076	1,075
District of Columbia	8	8	33	(T)	(T)	(D)	(D)	(D)	46	540 (S)	672 (S)
Virginia	264	318	464	539	941	862	1,284	1,131	1,275	1,087	1,577
West Virginia	(T)	(T)	(T)	(T)	(T)	(D)	83	(D)	(D)	100 (S)	243
North Carolina	253	268	327	546	786	(D)	1,666	1,311	1,470	1,929	2,226
South Carolina	87	96	82	(T)	(T)	(D)	500	388	479	495	739
Georgia	91	99	147	220	348	(D)	958	722	993	860	1,175
Florida	398	462	620	1,449	(T)	1,973	2,041	2,352	(S)	2,425	4,101
East South Central	427	467	402	624	1,007	1,302	2,425	1,647	1,662	1,966	2,207
Kentucky	79	100	209	170	191	(D)	238	227	176	289	452
Tennessee	282	306	(T)	(T)	(T)	(D)	621	934	843	792	1,003
Alabama	56	48	62	100	187	(S)	1,523	430	596	833 (S)	686
Mississippi	10	13	(T)	(T)	(T)	62	42	56	(S)	52	66
West South Central	1,113	1,212	1,502	2,351	3,285	4,307	4,702	5,605	6,205	5,547	6,741
Arkansas	12	10	11	52	(T)	(D)	129	51	(S)	185	181
Louisiana	98	106	83	158	257	(D)	128	169	(S)	170	61
Oklahoma	116	142	174	339	407	(D)	367	333	448	311	288
Texas	887	954	1,233	(T)	(T)	3,762	4,077	5,051	5,439	4,882	6,211 (S)
West	6,855	7,379	10,176	11,873	17,843	25,570	26,207	30,998	(S)	36,983	40,465
Mountain	923	1,034	1,139	2,135	2,845	3,766	4,272	4,113	5,931	5,013	6,676
Montana	(T)	(T)	(T)	(T)	(T)	(D)	7	(D)	(S)	(D)	17
Idaho	(T)	(T)	(T)	(T)	(T)	451	467	(D)	(S)	391	827
Wyoming	(T)	(T)	(T)	(T)	2	3	4	(D)	2	15	25
Colorado	250	257	269	529	741	988	1,207	1,167	(S)	2,111	1,865
New Mexico	(T)	(T)	(T)	(T)	(T)	(D)	950	1,039	1,217	(D)	1,461
Arizona	203	200	372	758	(T)	1,079	809	921	1,080	1,042	1,356 (S)
Utah	112	132	142	265	242	(D)	774	389	407	411	803
Nevada	35	72	(T)	(T)	(T)	(S)	55	29	95	67	322

See explanatory information and SOURCE at end of table.

[illegible] Federal and other funds for industrial R&D performance in selected years, by state: 1976–95

Page 3 of 3

Area	1976	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995
	[Dollars in millions]										
Pacific	$5,932	$6,345	$9,037	$9,738	$14,998	$21,804	$21,935	$26,884	(S)	$31,971	$33,789
Washington	610	681	(T)	(T)	(T)	2,351	2,939	2,728	$3,677	4,689 (S)	4,294 (S)
Oregon	57	77	116	(T)	(T)	(D)	281	357	(S)	471	741
California	5,263	5,600	7,437	7,626	(T)	(S)	18,636	23,781	(S)	26,541	28,710
Alaska	(T)	(T)	(T)	(T)	(T)	(D)	10	9	21	14	30
Hawaii	(T)	(T)	(T)	(T)	(T)	13	70	9	13	255	14
Undistributed funds	2,030	2,291	3,245	(T)	3,931	1,495	2,281	2,945	772	714	1,773 (S)

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.
(T) = Data not separately available, but are included in total.

NOTES: The 1993 data collected during the 1995 survey includes respondent revisions for both total R&D and state R&D allocations. Companies new to the survey may not have reported data by state on the report form they received and may not have 1993 state data on their 1995 form. For companies such as these, 1993 state data were allocated to the state in which the company's headquarters was located.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible]

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Area	Total	Federal	Company
	[Dollars in millions]		
United States, total	$132,103	$23,451	$108,652
Alabama	686	273	413
Alaska	30	(D)	(D)
Arizona	1,356 (S)	620 (S)	736
Arkansas	181	(D)	(D)
California	28,710	6,925	21,785
Colorado	1,865	274	1,591
Connecticut	3,906	389	3,517
Delaware	1,077 (S)	12	1,065
District of Columbia	672 (S)	17 (S)	656
Florida	4,101	1,634	2,467
Georgia	1,175	142	1,031
Hawaii	14	(D)	(D)
Idaho	827	(D)	(D)
Illinois	5,776 (S)	146 (S)	5,630
Indiana	2,721 (S)	382	2,339
Iowa	998	(D)	(D)
Kansas	569	(D)	(D)
Kentucky	452	4 (S)	448
Louisiana	61	(D)	(D)
Maine	286	(D)	(D)
Maryland	1,075	287 (S)	788
Massachusetts	7,416	1,458 (S)	5,958
Michigan	12,388	148	12,240
Minnesota	2,636 (S)	315	2,321
Mississippi	66	(D)	(D)
Missouri	2,028 (S)	584 (S)	1,443
Montana	17	(D)	(D)
Nebraska	150	(D)	(D)
Nevada	322	(D)	(D)
New Hampshire	472	36	436
New Jersey	8,200	197	8,002
New Mexico	1,461	1,380	81
New York	8,651	1,821 (S)	6,831
North Carolina	2,226	15	2,212
North Dakota	12	(D)	(D)
Ohio	4,001	574	3,428
Oklahoma	288	38	249
Oregon	741	35	706
Pennsylvania	5,331	376 (S)	4,955
Rhode Island	520	(D)	(D)

See explanatory information and SOURCE at end of table.

[illegible]

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Area	Total	Federal	Company
	[Dollars in millions]		
South Carolina	$739	(D)	(D)
South Dakota	19	0	$19
Tennessee	1,003	(D)	(D)
Texas	6,211 (S)	$912 (S)	5,298
Utah	803	178	625
Vermont	248	(D)	(D)
Virginia	1,577	743	834
Washington	4,294 (S)	(D)	(D)
West Virginia	243	(D)	(D)
Wisconsin	1,706	33 (S)	1,673
Wyoming	25	(D)	(D)
Undistributed funds	1,773 (S)	477 (S)	1,296

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[redacted]

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Industry and size of company	SIC code	U.S. total	California	Michigan	New York	New Jersey	Massa-chusetts	Texas	Illinois	Penn-sylvania	Washington	Ohio	All other states plus undistri-tributed
		[Dollars in millions]											
All industries		$132,103	$28,710	$12,388	$8,651	$8,200	$7,416	$6,211 (S)	$5,776 (S)	$5,331	$4,294 (S)	$4,001	$41,128
Distribution by industry:													
Manufacturing		100,067	22,354	12,004	5,966	5,610	3,573	4,769	4,498	4,247	2,983 (S)	3,373	30,690
Food, kindred, and tobacco products	20,21	1,566	36	(D)	86	223	(D)	6	239	44 (S)	92	28	724
Textiles and apparel	22,23	(D)	(D)	(D)	22	(D)	16	25	(D)	(D)	0	(D)	125
Lumber, wood products, and furniture	24,25	(D)	7	74	(D)	1	0	1	5	5	(D)	3	131
Paper and allied products	26	(D)	60 (S)	(D)	(D)	(D)	32	(D)	39	15 (S)	(D)	37	1,019
Chemicals and allied products	28	17,547	1,360	922	1,031	3,182	527	408	1,232 (S)	1,784	196 (S)	883	6,022
Industrial chemicals	281–82,286	(D)	230	(D)	72	858	147 (S)	300	147	328	(D)	351	2,481
Drugs and medicines	283	10,215	1,057	(D)	456	2,097	352	85	(D)	1,359	191 (S)	(D)	3,103
Other chemicals	284–85,287–89	(D)	73	54	50[illegible]	226	28	23	(D)	97	(D)	(D)	437
Petroleum refining and extraction	13,29	1,760	(D)	0	59	(D)	(D)	808	(D)	(D)	0	(D)	58
Rubber products	30	(D)	123 (S)	34	47 (S)	24	22	26	21	40	4	585	(D)
Stone, clay, and glass products	32	448	20	30	7	5	(D)	9	29	128	(D)	113	105
Primary metals	33	593	(D)	26	13 (S)	14	3	33	28	241 (S)	6 (S)	40	(D)
Ferrous metals and products	331–32, 3398–99	(D)	2	19 (S)	0	5	(D)	(D)	(D)	(D)	0	(D)	(D)
Nonferrous metals and products	333–36	(D)	(D)	7	13 (S)	9	(D)	(D)	(D)	(D)	6 (S)	(D)	119
Fabricated metal products	34	1,023	83	71	34	12	116	21	66	74	3	154	389
Machinery	35	(D)	3,306	404	452	235	448	408 (S)	709	375	44	307	(D)
Office, computing, and accounting machines	357	(D)	2,700	(D)	84	85 (S)	237	(D)	25	(D)	(D)	(D)	(D)
Other machinery, except electrical	351–56,358–59	5,041	606	(D)	368	150	211	(D)	684	(D)	(D)	(D)	1,953

See explanatory information and SOURCE at end of table.

Table A-[illegible] Total (company, Federal, and other) funds for industrial R&D performance, by industry and size of company, for U.S. and top 10 R&D-performing states: 1995

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Industry and size of company	SIC code	U.S. total	California	Michigan	New York	New Jersey	Massa-chusetts	Texas	Illinois	Penn-sylvania	Washington	Ohio	All other states plus undistri-buted
		[Dollars in millions]											
Distribution by industry:													
Electrical equipment	36	$18,751	$6,786	$409	$597	$410	$1,277	$1,533	$1,337	$457 (S)	$179	$757	$5,008
Radio and TV receiving equipment	365	(D)	19	0	(D)	(D)	(D)	0	(D)	(D)	(D)	0	21
Communication equipment	366	(D)	748	(D)	179	223 (S)	284	675	147	23	10	32	2,020
Electronic components	367	(D)	4,902	272	(D)	34	593	813	(D)	(D)	(D)	(D)	2,160
Other electrical equipment	361–64,369	(D)	1,117	(D)	328	(D)	(D)	46	189	209	10	(D)	805
Transportation equipment	37	32,441	8,875	9,794	(D)	38	59	157	198	243	(D)	298	8,279
Motor vehicles and motor vehicles equipment	371	(D)	(D)	(D)	24	(D)	(D)	13	(D)	(D)	(D)	(D)	1,321
Other transportation equipment	373–75,379	(D)	(D)	(D)	0	(D)	(D)	0	(D)	(D)	0	(D)	286
Aircraft and missiles	372,376	16,951	5,096 (S)	180	(D)	(D)	(D)	144	90	(D)	(D)	32	6,673
Professional and scientific instruments	38	11,976	1,394	101	1,097	908 (S)	1,018	1,281 (S)	351	652	224	83	4,867
Scientific and mechanical measuring instruments	381–82	7,146	753	38	(D)	33	562	(D)	(D)	214 (S)	185	46	3,983
Optical, surgical, photographic, and other instruments	384–87	4,831	641	63 (S)	(D)	876 (S)	457	(D)	(D)	438	39	36	885
Other manufacturing industries	27,31,39	(D)	102	6	83	63	37	(D)	60	83	10	49	337
Nonmanufacturing		32,036	6,356	384	2,685	2,590	3,841	1,442	1,278	1,084	1,312 (S)	628	10,436
Transportation and utilities	40–42,44–49	5,435	280	7	(D)	(D)	412	102	(D)	(D)	2	(D)	1,768
Communications	48	(D)	222	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1,509
Telephone communications	481	(D)	215	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1,476
Other communications	482–484,489	59	7	0	(D)	(D)	(D)	(D)	(D)	(D)	0	0	33

See explanatory information and SOURCE at end of table.

[illegible] company, Federal, and other funds for industrial R&D performance, by industry and size of company, for U.S. and top 10 R&D-performing states: [illegible]

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Industry and size of company	SIC code	U.S. total	California	Michigan	New York	New Jersey	Massachusetts	Texas	Illinois	Pennsylvania	Washington	Ohio	All other states plus undistributed
		[Dollars in millions]											
Distribution by industry:													
Electric, gas, and sanitary services	49	$440	(D)	$6	$57	$11	(D)	(D)	$42	$12	(D)	$10	$178
Other transportation and utilities	40–42,44–47	(D)	(D)	(D)	(D)	(D)	$0	(D)	(D)	(D)	$0	0	80
Trade	50–59	(D)	$1,320	(D)	1,537	64	1,234	(D)	173	34	71	21	2,425
Finance, insurance, and real estate	60–65,67	(D)	6	0	129 (S)	(D)	0	(D)	23	0	0	(D)	489
Services	701,72,73, 75–81,83,84, 87,89	17,876	4,734	360	676	1,253	2,194 (S)	$544	231	761	1,234 (S)	355	5,534
Business services	73	9,293	2,325	(D)	362	1,021	591	422	162	198	1,123 (S)	(D)	2,832
Computer and data processing services	737	9,059	2,286	150	(D)	(D)	(D)	417	157	(D)	(D)	105	2,676
Other business services	731–736,738	234	39	(D)	(D)	(D)	(D)	4	5	(D)	(D)	(D)	156
Health services	80	756	124	0	(D)	(D)	(D)	9	(D)	(D)	(D)	(D)	65
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	(D)	(D)	0	(D)	(D)	0	0	(D)	(D)	0	(D)	61
Other health services	802–805, 808–809	(D)	(D)	0	0	(D)	(D)	9	0	0	(D)	0	4
Engineering and management services	87	7,662	2,256	207	187	207	1,601 (S)	(D)	49	132	110	245	(D)
Engineering, architectural, and surveying	871	2,933	(D)	(D)	(D)	85	(D)	63 (S)	17	(D)	(D)	46	971
Research, development, and testing	873	(D)	1,836	56	136	122	416	49	28	102	74	199	(D)
Other engineering and management services	872,874	(D)	(D)	(D)	(D)	0	(D)	(D)	4	(D)	(D)	0	9

See explanatory information and SOURCE at end of table.

[illegible]

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Industry and size of company	SIC code	U.S. total	California	Michigan	New York	New Jersey	Massa-chusetts	Texas	Illinois	Penn-sylvania	Washington	Ohio	All other states plus undistri-buted
		[Dollars in millions]											
Distribution by industry:													
Other services	701,72,75–79, 81,83,84,89	$165	$30	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Other nonmanufacturing industries	07–12,14,15, 161–162,17	413	15	(D)	(D)	$18	(D)	$82	$30	(D)	(D)	(D)	$220
Distribution by size of company: [Number of employees]													
Total		132,103	28,710	$12,388	$8,651	8,200	$7,416	6,211	5,776	$5,331	$4,294 (S)	$4,001	41,128
Fewer than 500		16,662	6,109	839	2,089 (S)	1,039	1,519	676	608	545	650	479	2,109
500 to 999		4,693	1,295	123	156	185	372	203	183	139	37	190	1,810
1,000 to 4,999		16,960	4,176	594	648	707	1,285	580	763	547	118	411	7,131
5,000 to 9,999		9,532	2,594	560	337	1,142	342	359	209	616	(D)	227	(D)
10,000 to 24,999		17,071	3,391	598	679	1,031	230	1,171	553	1,534	(D)	657	(D)
25,000 or more		67,185	11,145	9,674	4,742	4,096	3,668	3,222	3,460	1,950	(D)	2,037	(D)

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible] and other funds for industrial R&D [illegible] company and type of cost: [illegible]

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Industry and size of company	SIC code	Total R&D costs	Wages of R&D personnel	Materials and supplies	Overhead costs
			[Percent]		
All Industries		$132,103	45.1%	16.9%	38.0%
Distribution by industry:					
Manufacturing		100,067	43.3	18.3	38.4
Food, kindred, and tobacco products	20,21	1,566	47.7	12.2	40.1
Textiles and apparel	22,23	(D)	50.4 (S)	20.4	29.2
Lumber, wood products, and furniture	24,25	(D)	56.5	10.2 (S)	33.3
Paper and allied products	26	(D)	48.6	13.0	38.4 (S)
Chemicals and allied products	28	17,547	42.1	12.1	45.9
Industrial chemicals	281–82,286	(D)	45.9	13.1	40.9
Drugs and medicines	283	10,215	40.3	12.1	47.6
Other chemicals	284–85,287–89	(D)	41.5	8.9	49.6
Petroleum refining and extraction	13,29	1,760	47.0	14.4	38.6
Rubber products	30	(D)	39.8	16.0	44.2
Stone, clay, and glass products	32	448	48.7	10.8	40.5
Primary metals	33	593	50.1	18.9	31.0
Ferrous metals and products	331–32,3398–99	(D)	51.5	11.2	37.3
Nonferrous metals and products	333–36	(D)	49.2	23.7	27.1
Fabricated metal products	34	1,023	52.2	16.7	31.1
Machinery	35	(D)	52.5	18.9	28.6
Office, computing, and accounting machines	357	(D)	54.5	13.4	32.1
Other machinery, except electrical	351–56,358–59	5,041	50.9	24.7	24.3
Electrical equipment	36	18,751	48.6	15.6	35.9
Radio and TV receiving equipment	365	(D)	61.2 (S)	11.0	27.7
Communication equipment	366	(D)	54.8	14.1	31.1
Electronic components	367	(D)	49.8	14.8	35.4 (S)
Other electrical equipment	361–64,369	(D)	38.0	19.6	42.5
Transportation equipment	37	32,441	35.7	24.6	39.7
Motor vehicles and motor vehicles equipment	371	(D)	37.9	29.4	32.7
Other transportation equipment	373–75,379	(D)	66.3	21.4 (S)	12.3 (S)
Aircraft and missiles	372,376	16,951	32.7	20.5 (S)	46.8 (S)
Professional and scientific instruments	38	11,976	49.6	15.8 (S)	34.5
Scientific and mechanical measuring instruments	381–82	7,146	47.4	15.6 (S)	37.0
Optical, surgical, photographic, and other instruments	384–87	4,831	53.1	16.0	30.9
Other manufacturing industries	27,31,39	(D)	68.3	12.8	18.9
Nonmanufacturing		32,036	0.5	0.1	0.4
Transportation and utilities	40–42,44–49	5,435	63.6	5.8	30.6
Communications	48	(D)	66.7	5.6	27.7
Telephone communications	481	(D)	66.6	5.6	27.7
Other communications	482–484,489	59	79.7	4.9	15.4
Electric, gas, and sanitary services	49	440	23.6	8.9	67.5
Other transportation and utilities	40–42,44–47	(D)	66.9	1.9 (S)	31.3

See explanatory information and SOURCE at end of table.

[illegible] funds for industrial R&D performance, by industry [illegible] and type of cost: 1995

Page 2 of 2

Industry and size of company	SIC code	Total R&D costs	Wages of R&D personnel	Materials and supplies	Overhead costs
				[Percent]	
Distribution by industry:					
Trade	50–59	(D)	47.5%	10.7%	41.8%
Finance, insurance, and real estate	60–65,67	(D)	75.2	1.9	23.0 (S)
Services	701,72,73,75–81, 83,84,87,89	17,876	52.3	14.0	33.7
Business services	73	9,293	54.9	14.8	30.3
Computer and data processing services	737	9,059	54.5	14.9	30.7
Other business services	731–736,738	234	80.3 (S)	11.8 (S)	7.8
Health services	80	756	48.4	25.1	26.5
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	(D)	48.1	25.2	26.7
Other health services	802–805,808–809	(D)	85.9 (S)	9.6	4.5
Engineering and management services	87	$7,662	49.9 (S)	11.3	38.8
Engineering, architectural, and surveying	871	2,933	46.7 (S)	11.9 (S)	41.4 (S)
Research, development, and testing	873	(D)	51.2 (S)	11.3	37.5
Other engineering and management services	872,874	(D)	94.1	0.7	5.2
Other services	701,72,75–79,81, 83,84,89	165	51.6	21.1	27.3
Other nonmanufacturing industries	07–12,14,15, 161–162,17	413	59.6	8.8	31.6
Distribution by size of company: [Number of employees]					
Total		132,103	0.5	0.2	0.4
Fewer than 500		16,662	73.9	7.9	18.3
500 to 999		4,693	53.0	12.9	34.1
1,000 to 4,999		16,960	48.1	14.7	37.2
5,000 to 9,999		9,532	49.5	18.5	32.0
10,000 to 24,999		17,071	46.1	13.6	40.2
25,000 or more		67,185	42.1	18.6	39.3

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
		[In thousands]											
Total (January)		622.5	671.0	695.8	708.6	722.5	743.6	773.4	779.3	764.7	768.5	746.1	832.8
Total (Annual average)		646.8	683.4	702.2	715.6	733.0	758.5	776.4	772.0	766.6	758.8	789.4	NA
All Industries		622.5	671.0	695.8	708.6	722.5	743.6	773.4	779.3	764.7	768.5	746.1	832.8
Distribution by industry:													
Manufacturing		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	547.2	606.2
Food, kindred, and tobacco products	20,21	(S)	(S)	(S)	(S)	(S)	(S)	9.4	9.8	9.6	10.3	8.9	9.8
Textiles and apparel	22,23	2.8	2.6	2.4	2.4	2.5	2.8	(S)	2.8	3.1	3.3	2.9	3.8
Lumber, wood products, and furniture	24,25	(S)	(S)	1.3	1.3	1.4	(S)	(S)	1.5	1.6	3.3	2.3	2.9
Paper and allied products	26	6.6	6.4	6.0	6.1	6.4	8.5	(S)	10.7	10.6	10.6	10.6	11.0 (S)
Chemicals and allied products	28	71.1	75.8	75.2	75.8	78.3	80.4	81.6	85.6	86.5	93.1	99.6	94.3
Industrial chemicals	281–82,286	23.5	24.9	(S)	(S)	(S)	(S)	(S)	29.9	26.4	28.8	33.7	28.4
Drugs and medicines	283	30.8	31.8	32.6	33.0	34.4	34.3	35.4	38.7	42.3	48.5	50.3	49.0
Other chemicals	284–85,287–89	16.7	19.1	20.2	20.3	18.8	18.9	17.0	17.0	17.8	15.8	15.6	16.9
Petroleum refining and extraction	13,29	13.5	10.4	9.9	9.5	10.7	11.1	11.4	11.5	11.0	9.7	8.4	8.4
Rubber products	30	(S)	(S)	(S)	(S)	(S)	(S)	(S)	14.8	13.0	9.0	9.8	10.2
Stone, clay, and glass products	32	6.6	7.5	8.6	8.6	7.6	7.0	6.0	5.3	5.1	4.0	4.3	3.9
Primary metals	33	7.1	5.7	5.5	5.6	5.5	5.2	4.6	5.1	4.6	5.1	6.5	4.1
Ferrous metals and products	331–32,3398–99	4.2	2.5	(S)	2.3	2.3	(S)	(S)	1.7	1.6	2.6	1.9	1.6
Nonferrous metals and products	333–36	2.9	3.2	3.4	3.3	3.3	3.3	3.0	(S)	(S)	2.5	4.6	2.5
Fabricated metal products	34	(S)	(S)	9.9	10.5	9.9	10.1	(S)	8.7	7.9	10.2	9.2	9.1
Machinery	35	81.7	89.7	95.8	98.4	100.4	113.3	109.7	99.3	97.4	70.4	68.6	87.3
Office, computing, and accounting machines	357	61.8	71.9	73.4	74.4	75.0	84.7	77.6	67.1	65.8	34.6	31.8	33.7
Other machinery, except electrical	351–56,3508–59	19.9	17.8	22.4	24.0	25.4	28.6	32.1	32.2	31.6	35.8	36.8	53.6
Electrical equipment	36	113.2	117.9	130.4	132.5	122.5	105.2	95.9	91.9	89.2	96.5	103.3	125.8
Radio and TV receiving equipment	365	(S)	1.8	1.2	1.3	1.5	0.8	1.0	1.0	1.0	0.8	0.9	1.3
Communication equipment	366	62.2	65.0	71.9	73.1	58.0	47.1	35.8	31.2	(S)	36.0 (S)	41.7 (S)	34.7 (S)
Electronic components	367	29.2	(S)	43.7	44.3	42.8	(S)	32.6	28.4	28.9	40.1	40.8	64.6 (S)
Other electrical equipment	361–64,369	17.9	16.5	13.6	(S)	(S)	21.3	(S)	31.2	28.8	19.6	20.0	25.3

See explanatory information and SOURCE at end of table

Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
		[In thousands]											
Distribution by industry:													
Transportation equipment	37	160.3	179.2	187.3	188.2	185.4	170.2	149.7	141.1	147.5	129.6	120.8	156.6
Motor vehicles and motor vehicles equipment	371	28.7	33.9	46.5	47.3	45.8	49.4	45.3	44.5	45.1	51.0	51.1	57.0
Other transportation equipment	373–75,379	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	5.8 (S)	6.2	4.0
Aircraft and missiles	372,376	130.2	144.8	136.3	136.4	134.8	115.3	100.2	92.9	97.9	72.8	63.5	95.5
Professional and scientific instruments	38	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	100.6 (S)	84.4	70.9 (S)
Scientific and mechanical measuring instruments	381–82	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	66.4 (S)	63.2	48.2 (S)
Optical, surgical, photographic, and other instruments	384–87	19.8	24.0	24.6	24.9	14.5	8.1	(S)	(S)	20.8	34.2	21.2	22.7
Other manufacturing industries	27,31,39	(S)	(S)	6.3	6.4	5.4	5.6	(S)	6.0	5.8	15.5	7.5	8.2
Nonmanufacturing 1/		66.8	75.1	96.4	101.9	125.2	(S)	(S)	202.6	196.5	197.4	198.9	226.6
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	29.3
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	25.4
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24.7
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.8
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.2 (S)
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.7
Trade	50-59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	47.5
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.6
Services	701,72,73,75–81,83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	139.6
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80.2
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	77.3
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.0

See explanatory information and SOURCE at end of table

Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
		[In thousands]											
Distribution by industry:													
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.0
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.4
Other health services	802–805,808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.6
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	52.9
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	22.8 (S)
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	28.8
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4
Other services	701,72,75–79, 81,83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.5
Other nonmanufacturing industries	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.6
Distribution by size of company: [Number of employees]													
Total		622.5	671.0	695.8	708.6	722.5	743.6	773.4	779.3	764.7	768.5	746.1	832.8
Fewer than 500		78.3	(S)	105.2	109.0	105.4	(S)	(S)	142.1	125.1	148.6	139.8	165.1
500 to 999		16.5	(S)	18.4	19.3	18.0	18.6	18.6	46.2	46.1	27.9	29.7	36.6
1,000 to 4,999		61.6	66.7	76.4	81.9	76.1	75.4	79.3	94.2	99.3	108.9	110.8	124.4
5,000 to 9,999		28.5	38.9	40.5	40.2	47.3	57.2	55.1	57.6	56.4	60.3	52.8	61.1
10,000 to 24,999		89.9	88.4	92.0	94.5	87.0	73.9	90.3	99.9	102.6	90.6	91.8	97.0
25,000 or more		347.6	365.3	363.3	363.7	388.7	404.2	408.4	339.2	335.2	332.1	321.2	348.6

1/ Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY: (S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.
NA = Not available

NOTE: As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible] Number of full-time-equivalent (FTE) R&D scientists and engineers in R&D-performing companies, by industry, size of company, and source of R&D funds: January 1996

Page 1 of 2

Industry	SIC code	Total	Federal	Company
		(In thousands)		
All industries		832.8	121.4 (S)	711.4
Distribution by industry:				
Manufacturing		606.2	100.1 (S)	506.1
Food, kindred, and tobacco products	20,21	9.8	0.0	9.8 (S)
Textiles and apparel	22,23	3.8	(D)	(D)
Lumber, wood products, and furniture	24,25	2.9	(D)	(D)
Paper and allied products	26	11.0 (S)	(D)	(D)
Chemicals and allied products	28	94.3	0.6 (S)	93.7
Industrial chemicals	281–82,286	28.4	(D)	(D)
Drugs and medicines	283	49.0	0.0 (S)	49.0
Other chemicals	284–85,287–89	16.9	(D)	(D)
Petroleum refining and extraction	13,29	8.4	0.0 (S)	8.4
Rubber products	30	10.2	(D)	(D)
Stone, clay, and glass products	32	3.9	(D)	(D)
Primary metals	33	4.1	(D)	(D)
Ferrous metals and products	331–32,3398–99	1.6	(D)	(D)
Nonferrous metals and products	333–36	2.5	0.0 (S)	2.5
Fabricated metal products	34	9.1	(D)	(D)
Machinery	35	87.3	0.4 (S)	86.9
Office, computing, and accounting machines	357	33.7	0.1 (S)	33.6
Other machinery, except electrical	351–56,358–59	53.6	0.2 (S)	53.4
Electrical equipment	36	125.8	12.8	113.0
Radio and TV receiving equipment	365	1.3	(D)	(D)
Communication equipment	366	34.7 (S)	(D)	(D)
Electronic components	367	64.6 (S)	(D)	(D)
Other electrical equipment	361–64,369	25.3	(D)	(D)
Transportation equipment	37	156.6	65.1 (S)	91.5 (S)
Motor vehicles and motor vehicles equipment	371	57.0	(D)	(D)
Other transportation equipment	373–75,379	4.0	(D)	(D)
Aircraft and missiles	372,376	95.5	62.1 (S)	33.4 (S)
Professional and scientific instruments	38	70.9 (S)	19.3 (S)	51.6 (S)
Scientific and mechanical measuring instruments	381–82	48.2 (S)	18.8 (S)	29.4
Optical, surgical, photographic, and other instruments	384–87	22.7	0.5 (S)	22.2 (S)
Other manufacturing industries	27,31,39	8.2	(D)	(D)
Nonmanufacturing		226.6	21.3	205.3
Transportation and utilities	40–42,44–49	29.3	(D)	(D)
Communications	48	25.4	(D)	(D)
Telephone communications	481	24.7	(D)	(D)
Other communications	482–484,489	0.8	0.0	0.8 (S)

See explanatory information and SOURCE at end of table.

Table [illegible] Number of full-time-equivalent (FTE) R&D scientists and engineers in R&D-performing [illegible] industry, size of company, and source of R&D funds: January 1996

Page 2 of 2

Industry	SIC code	Total	Federal	Company
		(In thousands)		
Distribution by industry:				
Electric, gas, and sanitary services	49	3.2 (S)	(D)	(D)
Other transportation and utilities	40–42,44–47	0.7	(D)	(D)
Trade	50–59	47.5	(D)	(D)
Finance, insurance, and real estate	60–65,67	5.6	0.0	5.6
Services	701,72,73,75–81, 83,84,87,89	139.6	19.4	120.2
Business services	73	80.2	1.5 (S)	78.7
Computer and data processing services	737	77.3	(D)	(D)
Other business services	731–736,738	3.0	(D)	(D)
Health services	80	5.0	(D)	(D)
Offices and clinics of medical doctors , hospitals, medical and dental labs	801,806,807	4.4	(D)	(D)
Other health services	802–805,808–809	0.6	(D)	(D)
Engineering and management services	87	52.9	17.7	35.2 (S)
Engineering, architectural, and surveying	871	22.8 (S)	9.6	13.2 (S)
Research, development, and testing	873	28.8	(D)	(D)
Other engineering and management services	872,874	1.4	(D)	(D)
Other services	701,72,75–79, 81,83,84,89	1.5	(D)	(D)
Other nonmanufacturing industries	07–12,14,15, 161–162,17	4.6	0.0 (S)	4.6
Distribution by size of company: [Number of employees]				
Total		832.8	121.4 (S)	711.4
Fewer than 500		165.1	2.5 (S)	162.6 (S)
500 to 999		36.6	1.1 (S)	35.5 (S)
1,000 to 4,999		124.4	3.8	120.6
5,000 to 9,999		61.1	1.1	60.0
10,000 to 24,999		97.0	12.6 (S)	84.4
25,000 or more		348.6	100.2 (S)	248.4

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

Table A-54. Cost per R&D scientist or engineer in R&D-performing companies, by industry and size of company: 1985–95

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
		[Cost in dollars]										
All Industries		$130,200	$128,500	$128,800	$132,300	$134,500	$141,300	$148,600	$157,912	$153,336	$157,601	$167,339
Distribution by industry:												
Manufacturing		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	173,523
Food, kindred, and tobacco products	20,21	(D)	(D)	(S)	(D)	(D)	(D)	130,000	144,215	135,261	153,609	167,017
Textiles and apparel	22,23	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Lumber, wood products, and furniture	24,25	116,300	(S)	(S)	(D)	(S)	(S)	(D)	(D)	(D)	(D)	(D)
Paper and allied products	26	(D)	(D)	(D)	(D)	(S)	(S)	(D)	(D)	(D)	(D)	(D)
Chemicals and allied products	28	116,300	117,100	125,000	139,400	149,000	159,000	167,600	183,508	(D)	(D)	180,971
Industrial chemicals	281–82,286	144,600	150,200	(S)	(S)	(S)	(S)	181,000	193,871	(D)	(D)	(D)
Drugs and medicines	283	(D)	113,600	(D)	142,800	(D)	(D)	(D)	196,631	202,607	195,145	205,637
Other chemicals	284–85,287–89	(D)	83,100	(D)	105,600	(D)	(D)	(D)	135,423	(D)	(D)	(D)
Petroleum refining and extraction	13,29	(D)	(D)	187,400	182,700	194,000	201,800	217,000	205,318	208,360	209,439	209,495
Rubber products	30	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Stone, clay, and glass products	32	(D)	118,000	122,500	(D)	(D)	(D)	(D)	(D)	137,990	141,842	110,172
Primary metals	33	(D)	(D)	131,500	118,600	(S)	(D)	142,200	114,057	138,552	116,556	111,743
Ferrous metals and products	331–32, 3398–99	(D)	(D)	(D)	(S)	(D)	(D)	(D)	(D)	138,851	(D)	(D)
Nonferrous metals and products	333–36	136,400	138,800	(D)	(S)	(D)	(D)	(D)	(D)	138,326 (S)	(D)	(D)
Fabricated metal products	34	112,900	(S)	76,600	88,100	(S)	(S)	115,500	123,828	129,131	113,168	112,010
Machinery	35	142,500	(D)	(D)	(D)	130,000	138,500	147,800	152,797	100,631	118,717	(D)
Office, computing, and accounting machines	357	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	99,564	126,476	(D)
Other machinery, except electrical	351–56,358–59	(D)	119,200	98,300	99,400	(D)	(D)	(D)	(D)	102,213	111,691	111,421
Electrical equipment	36	124,900	120,700	124,300	124,100	132,400	142,800	147,100	150,118	144,725	151,872	163,626
Radio and TV receiving equipment	365	(D)	88,700	97,900	124,200	103,400	113,200	(D)	(D)	(D)	(D)	(D)
Communication equipment	366	147,800	141,300	155,300	160,300	170,600	177,100	(S)	(D)	(D)	(D)	(D)
Electronic components	367	114,100	(D)	98,400	(S)	(S)	128,400	(D)	127,801	154,366	148,761	(D)
Other electrical equipment	361–64,369	(D)	(D)	(S)	68,500	(S)	(S)	(D)	(D)	(D)	(D)	(D)

See explanatory information and SOURCE at end of table.

Table A-34. Cost per R&D scientist or engineer in R&D-performing companies, by industry and size of company: 1985-95

Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
		[Cost in dollars]										
Distribution by industry:												
Transportation equipment	37	(D)	$170,700	$183,400	$195,600	$211,700	$215,700	$189,400	$191,274	$196,777	$228,881	$233,968
Motor vehicles and motor vehicles equipment	371	$223,100	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Other transportation equipment	373-75,379	(D)	(S)	(S)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Aircraft and missiles	372,376	161,700	149,800	180,400	193,300	207,300	213,700	177,000	180,552	176,450	217,219	213,328
Professional and scientific instruments	38	122,000	(S)	(S)	(S)	(S)	(S)	(S)	(S)	115,180 (S)	119,693	154,251
Scientific and mechanical measuring instruments	381-82	(D)	(D)	(D)	(S)	(S)	(S)	(S)	(S)	94,036 (S)	102,570	128,237
Optical, surgical, photographic, and other instruments	384-87	(D)	(D)	(D)	316,700	(S)	(S)	(S)	(S)	161,721	161,435	220,383
Other manufacturing industries	27,31,39	(D)	(S)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Nonmanufacturing 1/		94,600	86,800	69,100	74,900	(S)	(S)	137,400	152,411	159,188	142,125	150,578
Transportation and utilities	40-42,44-49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	370,933
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Other communications	482-484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	157,435
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	274,704
Other transportation and utilities	40-42,44-47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Trade	50-59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Finance, insurance, and real estate	60-65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Services	701,72,73, 75-81,83,84, 87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	256,085
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	231,680
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	234,483
Other business services	731-736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	158,453

See explanatory information and SOURCE at end of table.

[illegible]

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
		[Cost in dollars]										
Distribution by industry:												
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	$305,132
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Other health services	802–805, 808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	289,459
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	257,067
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Other services	701,72,75-79, 81,83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	221,147
Other nonmanufacturing industries	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	179,020

See explanatory information and SOURCE at end of table.

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[illegible]

Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
		[Cost in dollars]										
Distribution by size of company: [Number of employees]												
Total		$130,200	$128,500	$128,800	$132,300	$134,500	$141,300	$148,600	$157,912	$153,336	$157,601	$167,339
Fewer than 500		(S)	70,600	66,800	67,100	66,200	(S)	103,400	111,358	106,888	85,793	109,319
500 to 999		(S)	103,400	92,600	(S)	98,200	(S)	178,700	176,585	87,233	138,366	141,660
1,000 to 4,999		97,300	106,400	91,900	100,600	101,900	91,400	119,400	127,135	128,565	139,693	144,213
5,000 to 9,999		119,300	108,400	102,900	100,400	102,500	110,800	150,800	148,285	156,899	152,227	167,284
10,000 to 24,999		124,600	122,300	132,700	143,000	127,300	135,300	167,300	156,190	160,229	182,243	180,849
25,000 or more		155,300	154,300	157,700	160,700	168,200	193,700	180,100	182,839	184,804	195,890	200,606

1/ Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.
NA = Not available.

NOTES: The number of full-time-equivalent R&D scientists and engineers used to estimate the cost per R&D scientist or engineer is the arithmetic mean of the numbers of R&D scientists and engineers reported for January in two consecutive years. This number is then divided into the total R&D expenditures of the earlier years, and the ratio is attributed to the earlier year.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

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Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Cost in dollars]					
All industries		$167,339	$109,319	$141,660	$144,213	$167,284	$180,849	$200,606
Manufacturing		173,523	98,400	130,670	151,986	167,780	184,737	202,332
Food, kindred, and tobacco products	20,21	167,017	122,953	107,621	122,414	157,881 (S)	212,459	200,490
Textiles and apparel	22,23	(D)	71,427	197,772	122,877	150,368	104,801 (S)	(D)
Lumber, wood products, and furniture	24,25	(D)	73,966	76,315	96,588	81,134 (S)	(D)	(D)
Paper and allied products	26	(D)	85,086	148,439	179,429	137,594 (S)	90,201 (S)	142,090 (S)
Chemicals and allied products	28	180,971	69,543	135,714	193,701	175,005	198,451	195,126
Industrial chemicals	281–82,286	(D)	49,002	130,226	202,983	145,381	226,099	(D)
Drugs and medicines	283	205,637	108,945	165,281	218,021	(D)	207,293	208,916
Other chemicals	284–85,287–89	(D)	63,044	104,476	118,790	156,273 (S)	(D)	(D)
Petroleum refining and extraction	13,29	209,495	79,518	(D)	184,313	(D)	263,346	189,794
Rubber products	30	(D)	79,214	167,775	154,307	135,025 (S)	133,469 (S)	(D)
Stone, clay, and glass products	32	110,172	53,032	131,191 (S)	93,695	158,568 (S)	143,933	(D)
Primary metals	33	111,743	34,281	50,600	122,665 (S)	150,242	177,791	(D)
Ferrous metals and products	331–32,3398–99	(D)	57,112	64,449	90,689 (S)	154,711	(D)	(D)
Nonferrous metals and products	333–36	(D)	30,869	48,984	157,998	(D)	(D)	(D)
Fabricated metal products	34	112,010	65,092	104,640	96,859	(D)	169,888	(D)
Machinery	35	(D)	73,190 (S)	127,839	130,122	142,853	199,544	(D)
Office, computing, and accounting machines	357	(D)	105,300	135,692	149,962	179,995	(D)	(D)
Other machinery, except electrical	351–56,358–59	111,421	66,183 (S)	123,737	108,545	100,935 (S)	173,106	(D)
Electrical equipment	36	163,626	128,774	152,274	140,059	256,198	173,441 (S)	173,789 (S)
Radio and TV receiving equipment	365	(D)	77,750	126,338	120,711 (S)	0	0	0
Communication equipment	366	(D)	111,605	170,133	110,366	(D)	(D)	(D)
Electronic components	367	(D)	147,950	150,669	176,337	285,667	(D)	(D)
Other electrical equipment	361–64,369	(D)	125,365	111,627	136,759	210,359	95,493	(D)

See explanatory information and SOURCE at end of table.

Table A-55. Cost per R&D scientist or engineer in R&D performing companies, by industry and size of company: 1995

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Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Cost in dollars]					
Transportation equipment	37	$233,968	$73,983	$95,470 (S)	$142,906	$135,496 (S)	$130,119 (S)	$247,328
Motor vehicles and motor vehicles equipment	371	(D)	112,093	35,812	126,117	150,651	145,244 (S)	(D)
Other transportation equipment	373–75,379	(D)	(D)	(D)	145,460	(D)	(D)	(D)
Aircraft and missiles	372,376	213,328	46,776	(D)	155,907	178,336 (S)	(D)	220,787 (S)
Professional and scientific instruments	38	154,251 (S)	140,362	117,637	178,518	213,877	(D)	146,731 (S)
Scientific and mechanical measuring instruments	381–82	128,237 (S)	131,798	105,577	171,139	(D)	(D)	116,330 (S)
Optical, surgical, photographic, and other instruments	384–87	220,383	155,434	137,329	188,304	219,816	(D)	(D)
Other manufacturing industries	27,31,39	(D)	82,091	98,738	95,845	108,325 (S)	157,507 (S)	(D)
Nonmanufacturing		150,578	120,007	164,351	122,402	165,798	164,778	192,914
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA
Communications	48	NA	NA	NA	NA	NA	NA	NA
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA
Trade	50–59	NA	NA	NA	NA	NA	NA	NA
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA
Services	701,72,73,75–81,83,84,87,89	NA	NA	NA	NA	NA	NA	NA
Business services	73	NA	NA	NA	NA	NA	NA	NA
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA

See explanatory information and SOURCE at end of table.

Table A-53. Cost per R&D scientist or engineer in R&D-performing companies, by industry and size of company: 1995

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Industry	SIC code	Total	Size of company: Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Cost in dollars]					
Health services	80	NA	NA	NA	NA	NA	NA	NA
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA
Other health services	802–805,808–809	NA	NA	NA	NA	NA	NA	NA
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA
Other services	701,72,75–81,83,84,89	NA	NA	NA	NA	NA	NA	NA
Other nonmanufacturing industries	07–12,14,15,161–162,17	NA	NA	NA	NA	NA	NA	NA

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.
NA = Not available.

NOTES: The number of full-time-equivalent R&D scientists and engineers used to estimate the cost per R&D scientist or engineer is the arithmetic mean of the numbers of R&D scientists and engineers reported for January in two consecutive years. This number is then divided into the total R&D expenditures of the earlier years, and the ratio is attributed to the earlier year.

Data for nonmanufacturing industries are not available because data for these industries were not collected in 1994.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible] Cost per R&D scientist or engineer in R&D-performing companies ranked by size of R&D program: 1985–95

Page 1 of 1

Companies ranked by size of R&D program	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
First 4	$225,800	$225,900	$222,600	$226,200	$218,100	$219,600	$213,200	$202,492	$252,629	$218,906	$234,791
Next 4	176,200	171,400	196,900	210,700	225,800	249,000	223,700	238,950	199,559	245,626 (S)	188,928 (S)
Next 12	132,500	131,200	141,600	153,000	148,700	129,100	159,900	170,276	199,118	188,437	190,548
Next 20	144,000	125,600	146,300	154,500	132,500	145,800	(S)	(S)	(S)	182,699	204,159
Next 60	124,100	139,000	128,700	141,300	145,400	164,200	170,500	181,760	193,925	181,163	196,023
Next 100	122,800	146,700	128,600	137,300	141,900	137,000	169,000	173,101	138,227	174,524	162,707
Next 200	94,100	138,000	110,800	124,500	106,100	120,200	121,000	126,545	140,292	156,025	152,977
Average of above 400 R&D performing companies	144,400	160,400	153,100	160,600	161,500	161,200	169,000	158,098	154,814	174,536	167,339

KEY: (S) = Indicates imputation of more than 50 percent. Prior to 1993, data have been withheld.

NOTES: The number of full-time-equivalent R&D scientists and engineers used to estimate the cost per R&D scientist or engineer is the arithmetic mean of the numbers of R&D scientists and engineers reported for January in two consecutive years. This number is then divided into the total R&D expenditures of the earlier year, and the ratio is attributed to the earlier year.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

Table A-[illegible]. Domestic employment of R&D-performing companies, by industry and size of company: 1994–95

Page 1 of 5

Industry	SIC code	Total	Size of company: Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[In thousands]						
		1994						
All industries		17,443	2,316	706	2,756	1,748	2,989	6,929
Manufacturing		11,678	1,659	582	2,057	1,231	2,081	4,071
Food, kindred, and tobacco products	20,21	1,103	46	85	180	140	180	472
Textiles and apparel	22,23	446	31	(D)	137	47	155	(D)
Lumber, wood products, and furniture	24,25	337	42	22	82	61	(D)	(D)
Paper and allied products	26	696	170	8	79	72	165	203
Chemicals and allied products	28	1,225	105	46	183	143	341	407
Industrial chemicals	281–82,286	548	40	30	58	41	125	254
Drugs and medicines	283	382	28	(D)	61	38	136	(D)
Other chemicals	284–85,287–89	295	37	(D)	64	64	80	(D)
Petroleum refining and extraction	13,29	376	8	5	40	21	112	190
Rubber products	30	456	154	(D)	113	43	38	(D)
Stone, clay, and glass products	32	221	17	13	43	34	(D)	(D)
Primary metals	33	482	44	34	109	117	81	96
Ferrous metals and products	331–32,3398–99	279	24	12	76	88	(D)	(D)
Nonferrous metals and products	333–36	204	20	22	33	29	(D)	(D)
Fabricated metal products	34	612	186	39	183	(D)	146	(D)
Machinery	35	1,143	315	99	275	146	197	111
Office, computing, and accounting machines	357	201	30	15	62	39	(D)	(D)
Other machinery, except electrical	351–56,358–59	942	285	84	213	108	(D)	(D)
Electrical equipment	36	1,433	241	63	237	82	222	587
Radio and TV receiving equipment	365	21	7	3	12	0	0	0
Communication equipment	366	312	45	12	53	(D)	(D)	(D)
Electronic components	367	383	107	22	79	(D)	(D)	(D)
Other electrical equipment	361–64,369	717	82	27	93	28	148	340

See explanatory information and SOURCE at end of table.

Table A-[illegible]. Domestic employment of R&D-performing companies, by industry and size of company: 1994–95

Page 2 of 5

Industry	SIC code	Total	Size of company: Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[In thousands]						
		1994						
Transportation equipment	37	1,812	51	42	144	121	161	1,293
Motor vehicles and motor vehicles equipment	371	1,032	18	34	85	(D)	(D)	(D)
Other transportation equipment	373–75,379	148	20	6	20	(D)	(D)	(D)
Aircraft and missiles	372,376	632	12	3	39	35	52	492
Professional and scientific instruments	38	791	159	49	144	67	40	333
Scientific and mechanical measuring instruments	381–82	414	64	(D)	49	32	(D)	210
Optical, surgical, photographic, and other instruments	384–87	377	96	(D)	95	35	(D)	123
Other manufacturing industries	27,31,39	544	90	(D)	108	105	156	(D)
Nonmanufacturing 1/		5,765	657	124	699	517	908	2,858
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA
Communications	48	NA	NA	NA	NA	NA	NA	NA
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA
Trade	50–59	NA	NA	NA	NA	NA	NA	NA
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA
Services	701,72,73,75–81,	NA	NA	NA	NA	NA	NA	NA
	83,84,87,89		NA					
Business services	73	NA	NA	NA	NA	NA	NA	NA
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA
Health services	80	NA	NA	NA	NA	NA	NA	NA
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA
Other health services	802–805,808–809	NA	NA	NA	NA	NA	NA	NA

See explanatory information and SOURCE at end of table.

Table A-5. Domestic employment of R&D-performing companies, by industry and size of company: 1994-95

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Industry	SIC code	Total	Size of company: Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[In thousands]						
		1994						
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA
Other services	701,72,75–79,81, 83,84,89	NA	NA	NA	NA	NA	NA	NA
Other nonmanufacturing industries	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA
		1995						
All industries		17,759	1,935	835	2,735	1,916	2,649	7,689
Manufacturing		11,220	1,279	570	2,121	1,250	1,994	4,008
Food, kindred, and tobacco products	20,21	1,017	66	29	196	84	182	459
Textiles and apparel	22,23	387	27	30	96	(D)	141	(D)
Lumber, wood products, and furniture	24,25	234	39	23	76	47	(D)	(D)
Paper and allied products	26	547	14	11	89	50	146	237
Chemicals and allied products	28	1,211	109	45	207	283	288	278
Industrial chemicals	281–82,286	424	25	27	74	35	136	127
Drugs and medicines	283	348	21	7	64	22	(D)	(D)
Other chemicals	284–85,287–89	439	64	10	70	227	(D)	(D)
Petroleum refining and extraction	13,29	324	7	(D)	33	(D)	142	127
Rubber products	30	485	127	53	124	52	(D)	(D)
Stone, clay, and glass products	32	173	25	18	52	19	58	0
Primary metals	33	465	22	24	133	104	77	104
Ferrous metals and products	331–32,3398–99	264	6	8	86	(D)	(D)	(D)
Nonferrous metals and products	333–36	200	16	16	47	(D)	(D)	(D)

See explanatory information and SOURCE at end of table.

[illegible]

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Industry	SIC code	Total	Size of company: Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[In thousands]						
		1995						
Fabricated metal products	34	593	139	49	137	57	212	0
Machinery	35	1,172	224	95	306	157	200	191
Office, computing, and accounting machines	357	195	23	11	59	44	(D)	(D)
Other machinery, except electrical	351–56,358–59	977	201	85	246	113	(D)	(D)
Electrical equipment	36	1,384	178	80	274	101	173	579
Radio and TV receiving equipment	365	23	6	2	15	0	0	0
Communication equipment	366	236	47	21	55	(D)	(D)	(D)
Electronic components	367	454	58	30	108	(D)	(D)	(D)
Other electrical equipment	361–64,369	671	66	26	96	41	91	350
Transportation equipment	37	2,009	65	30	145	103	136	1,530
Motor vehicles and motor vehicles equipment	371	1,069	55	25	105	64	(D)	(D)
Other transportation equipment	373–75,379	153	(D)	3 (S)	19	0	55	(D)
Aircraft and missiles	372,376	786	(D)	2	21	38	(D)	700
Professional and scientific instruments	38	710	163	(D)	149	63	(D)	246
Scientific and mechanical measuring instruments	381–82	358	91	(D)	54	18	(D)	(D)
Optical, surgical, photographic, and other instruments	384–87	352	72	40	95	45	(D)	(D)
Other manufacturing industries	27,31,39	512	73	19	103	73	152	91
Nonmanufacturing		6,538	656	265	614	666	655	3,681
Transportation and utilities	40–42,44–49	2,061	(D)	(D)	158	132	222	1,525
Communications	48	895	3	(D)	46	(D)	0	840
Telephone communications	481	887	(D)	0	(D)	(D)	0	840
Other communications	482–484,489	8	(D)	(D)	(D)	0	0	0
Electric, gas, and sanitary services	49	501	(D)	0	103	119	(D)	(D)
Other transportation and utilities	40–42,44–47	664	(D)	0	9	(D)	(D)	(D)
Trade	50–59	1,869	303	16	137	259	91	1,063
Finance, insurance, and real estate	60–65,67	415	(D)	44	47	115	(D)	(D)

See explanatory information and SOURCE at end of table.

Table A-[illegible] Domestic employment of R&D-performing companies, by industry and size of company: 1994-95

Page 5 of 5

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[In thousands]						
		1995						
Services	701,72,73,75–81, 83,84,87,89	1,865	307	73	238	122	269	855
Business services	73	1,258	155	50	155	67	112	720
Computer and data processing services	737	518	133	(D)	130	46	(D)	85
Other business services	731–736,738	740	22	(D)	25	21	(D)	634
Health services	80	140	29	(D)	15	0	52	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	116	26	(D)	8	0	(D)	(D)
Other health services	802–805,808–809	24	3	(D)	7 (S)	0	(D)	0
Engineering and management services	87	324	107	(D)	53	23	59	(D)
Engineering, architectural, and surveying	871	202	42	11	42	(D)	(D)	(D)
Research, development, and testing	873	73	50	4	(D)	0	(D)	0
Other engineering and management services	872,874	49	15	(D)	(D)	(D)	(D)	0
Other services	701,72,75–79,81,	142	17	(D)	16	31	47	(D)
Other nonmanufacturing industries	07–12,14,15, 161–162,17	329	20	(D)	34	38	(D)	(D)

1/ Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.
NA = Not available.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible] industry and size of company, 1985–95

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
All Industries 1/		NA	NA	NA	NA	NA	NA	NA	NA	NA	44	47
Distribution by industry:												
Manufacturing		43	45	45	46	46	47	50	51	52	47	54
Food, kindred, and tobacco products	20,21	8	7	7	8	8	8	9	9	9	8	10
Textiles and apparel	22,23	5	4	4	(S)	(S)	6	7	8	7	7	10
Lumber, wood products, and furniture	24,25	6	5	5	5	5	6	5	6	16	7	12
Paper and allied products	26	13	11	11	11	13	16	17	19	19	15	20 (S)
Chemicals and allied products	28	57	70	68	69	69	69	69	71	80	84	78
Industrial chemicals	281–82,286	39	56	52	54	56	59	60	61	58	63	67
Drugs and medicines	283	81	98	98	94	92	96	95	116	138	141	141
Other chemicals	284–85,287–89	62	63	61	60	60	53	53	43	51	53	38
Petroleum refining and extraction	13,29	21	19	20	24	26	26	26	27	27	23	26
Rubber products	30	26	25	19	(S)	26	32	38	33	24	21	21
Stone, clay, and glass products	32	20	20	24	26	26	24	24	23	21	19	22
Primary metals	33	12	11	12	12	12	11	11	11	11	14	9
Ferrous metals and products	331–32,3398–99	11	7	9	9	8	7	7	7	9	7	6
Nonferrous metals and products	333–36	16	17	16	17	16	15	(S)	(S)	15	23	12
Fabricated metal products	34	(S)	(S)	17	17	(S)	20	19	16	21	15	15
Machinery	35	60	64	67	66	71	73	74	74	61	59	75
Office, computing, and accounting machines	357	99	107	115	114	126	131	137	139	124	157	173
Other machinery, except electrical	351–56,358–59	29	26	29	29	31	33	36	37	41	39	55
Electrical equipment	36	53	59	65	71	68	66	67	65	75	75	91
Radio and TV receiving equipment	365	23	55	45	45	44	30	30	28	51	43	56
Communication equipment	366	62	68	73	94	96	89	91	(S)	(S)	153 S	147 (S)
Electronic components	367	81	82	86	100	96	89	95	92	122	104	142 (S)
Other electrical equipment	361–64,369	30	26	28	26	30	38	43	44	31	29	38
Transportation equipment	37	71	69	68	72	71	68	73	76	70	68	78
Motor vehicles and motor vehicles equipment	371	28	38	42	41	41	43	49	51	54	50	53
Other transportation equipment	373–75,379	8	23	38	40	52	45	(S)	(S)	(S)	43	26
Aircraft and missiles	372,376	116	99	91	103	101	96	98	101	94	108	121

See explanatory information and SOURCE at end of table.

[illegible]

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Distribution by industry:												
Professional and scientific instruments	38	(S)	(S)	71	62	59	71	(S)	(S)	(S)	99	100 (S)
Scientific and mechanical measuring instruments	381–82	(S)	(S)	85	84	96	95	(S)	(S)	(S)	127	135 (S)
Optical, surgical, photographic, and other instruments	384–87	70	61	63	48	28	17	(S)	59	98	60	64
Other manufacturing industries	27,31,39	(S)	(S)	18	17	14	14	14	14	32	14	16
Nonmanufacturing 1/		NA	NA	NA	NA	NA	NA	NA	NA	NA	36	35
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	14
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	28
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	28
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	96
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6 (S)
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1
Trade	50–59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	25
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	13
Services	701,72,73,75–81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	75
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	64
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	149
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	35
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	38
Other health services	802–805,808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	163
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	113 (S)
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	392
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	28

See explanatory information and SOURCE at end of table.

[illegible] industry and size of company: 1985–95

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Industry and size of company	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Distribution by industry:												
Other services	701,72,75–79,81, 83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10
Other nonmanufacturing industries	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	14
Distribution by size of company: [Number of employees]												
Total 1/		NA	NA	NA	NA	NA	NA	NA	NA	NA	44	47
Fewer than 500		NA	NA	NA	NA	NA	NA	NA	NA	NA	60	85
500 to 999		NA	NA	NA	NA	NA	NA	NA	NA	NA	42	44
1,000 to 4,999		NA	NA	NA	NA	NA	NA	NA	NA	NA	41	45
5,000 to 9,999		NA	NA	NA	NA	NA	NA	NA	NA	NA	31	32
10,000 to 24,999		NA	NA	NA	NA	NA	NA	NA	NA	NA	31	37
25,000 or more		NA	NA	NA	NA	NA	NA	NA	NA	NA	48	45

1/ Until 1995, this table included only manufacturing companies.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.
NA = Not available.

NOTES: The number of R&D scientists and engineers per 1,000 employees for 1995 is derived by dividing the arithmetic mean of scientists and engineers employed in January 1995 and January 1996 by the number of employees in all activities in March 1995. Similar procedures were used for earlier years.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

Table A-[illegible]. R&D funds per employee in R&D-performing companies, by size of company: 1985-95

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Size of company [Number of employees]	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
	Total (company, Federal, and other) R&D funds per employee										
Total	$5,148	$5,153	$5,338	$5,594	$5,920	$6,291	$6,842	$7,366	$7,225	$6,945	$7,439
Fewer than 500	3,028	5,414	5,553	5,377	5,660	6,339	7,279	7,493	8,718	6,041	8,611
500 to 999	2,238	3,229	3,121	2,906	3,197	3,826	(T)	14,206	5,184	5,043	5,620
1,000 to 4,999	2,725	3,261	3,395	3,223	3,404	3,738	4,243	4,907	5,046	5,377	6,201
5,000 to 9,999	2,851	2,849	3,210	3,992	4,158	4,456	4,706	5,253	5,379	4,771	4,975
10,000 to 24,999	3,500	3,334	3,668	3,713	3,607	4,401	5,223	5,468	5,294	5,406	6,445
25,000 or more	7,071	6,878	7,035	7,388	7,863	8,005	8,252	8,908	9,123	9,305	8,738
	Company and other (except Federal) R&D funds per employee										
Total	3,383	3,503	3,562	3,844	3,607	4,401	5,322	5,839	5,834	5,682	6,118
Fewer than 500	2,407	4,750	4,811	4,782	5,201	5,701	6,242	6,384	7,828	5,559	7,589
500 to 999	1,700	2,997	2,859	2,677	3,029	3,598	(T)	13,937	4,871	4,792	5,350
1,000 to 4,999	2,316	2,725	2,799	2,761	2,990	3,346	3,817	4,488	4,623	5,094	5,910
5,000 to 9,999	2,409	2,316	2,682	3,335	3,624	4,286	4,228	4,764	4,935	4,625	4,848
10,000 to 24,999	2,769	2,697	2,969	3,163	3,217	3,863	4,106	4,282	4,400	4,622	5,710
25,000 or more	4,208	4,077	4,010	4,402	5,016	5,251	5,739	6,404	6,691	6,783	6,363

KEY: (T) = Data not separately available, but are included in total.

NOTES: Averages were derived by dividing total and company R&D funds for a calendar year by employment data for March of that year.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible] employment in R&D [illegible] R&D program: [illegible]

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Companies ranked by size of R&D program	1987	1988	1989	1990	1991	1992	1993	1994	1995
	[Percent]								
First 4 (1–4)	7%	7%	7%	7%	7%	7%	6%	6%	6%
Next 4 (5–8)	4	3	3	3	3	3	2	2	2
Next 12 (9–20)	6	6	6	5	5	5	5	4	4
Next 20 (21–40)	6	5	4	5	4	4	4	4	4
Next 60 (41–100)	8	9	10	9	9	8	8	7	7
Next 100 (101–200)	7	8	8	8	10	9	9	8	7
Next 200 (201–400)	9	9	9	11	10	10	10	9	9
All others	53	53	53	52	52	47	55	59	61

NOTE: As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible]

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Year	Total R&D		Federal		Company 1/	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]					
1953	$3,630	$17,988	$1,430	$7,086	$2,200	$10,902
1954	4,070	19,941	1,750	8,574	2,320	11,367
1955	4,640	22,372	2,180	10,511	2,460	11,861
1956	6,605	30,764	3,328	15,501	3,277	15,263
1957	7,731	34,856	4,335	19,545	3,396	15,311
1958	8,389	36,940	4,759	20,956	3,630	15,984
1959	9,618	41,908	5,635	24,553	3,983	17,355
1960	10,509	45,161	6,081	26,132	4,428	19,029
1961	10,908	46,338	6,240	26,508	4,668	19,830
1962	11,464	48,087	6,434	26,988	5,029	21,095
1963	12,630	52,363	7,270	30,141	5,360	22,222
1964	13,512	55,196	7,720	31,536	5,792	23,660
1965	14,185	56,831	7,740	31,010	6,445	25,821
1966	15,548	60,569	8,332	32,458	7,216	28,111
1967	16,385	61,854	8,365	31,578	8,020	30,276
1968	17,429	63,057	8,560	30,970	8,869	32,088
1969	18,308	63,262	8,451	29,202	9,857	34,060
1970	18,067	59,275	7,779	25,522	10,288	33,753
1971	18,320	57,143	7,666	23,911	10,654	33,231
1972	19,552	58,504	8,017	23,989	11,535	34,515
1973	21,249	60,195	8,145	23,074	13,104	37,122
1974	22,887	59,493	8,220	21,367	14,667	38,126
1975	24,187	57,465	8,605	20,444	15,582	37,021
1976	26,997	60,599	9,561	21,461	17,436	39,138
1977	29,825	62,882	10,485	22,106	19,340	40,776
1978	33,304	65,443	11,189	21,987	22,115	43,456
1979	38,226	69,212	12,518	22,665	25,708	46,547
1980	44,505	73,769	14,029	23,254	30,476	50,515
1981	51,810	78,488	16,382	24,817	35,428	53,671
1982	58,650	83,583	18,545	26,429	40,105	57,154
1983	65,268	89,213	20,680	28,267	44,588	60,946
1984	74,800	98,525	23,396	30,817	51,404	67,708
1985	84,239	107,270	27,196	34,631	57,043	72,638
1986	87,823	108,989	27,891	34,613	59,932	74,376
1987	92,155	110,950	30,752	37,024	61,403	73,926
1988	97,015	112,690	30,343	35,246	66,672	77,445
1989	102,055	113,748	28,554	31,826	73,501	81,923
1990	109,727	117,230	28,125	30,048	81,602	87,182

See explanatory information and SOURCE at end of table.

[illegible]

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Year	Total R&D		Federal		Company 1/	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]					
1991	$116,952	$120,173	$26,372	$27,098	$90,580	$93,074
1992	119,110	119,110	24,722	24,722	94,388	94,388
1993	117,400	114,380	22,809	22,222	94,591	92,158
1994	119,595	113,802	22,463	21,375	97,131	92,426
1995	132,103	122,590	23,451	21,762	108,652	100,828
1996	144,667	131,265	23,653	21,462	121,015	109,804

1/ Company-funded R&D includes funds for industrial R&D performed within company facilities from all sources except the Federal Government. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Company-financed R&D not performed within the company is excluded.

NOTES: 1992 gross domestic product (GDP) implicit price deflators were used to convert current dollars to constant dollars.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

Table A-23. Summary data for R&D-performing companies, by detailed industry, and size of company: 1995-96

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Industry and size of company	SIC code	Research and development funds						Domestic net sales		R&D scientists and engineers		Domestic employment	
		Total		Federal		Company				January 3/		March	
		1995	1996	1995	1996	1995	1996	1995	1996	1996	1997	1995	1996
		[Dollars in millions]								[in thousands]			
All Industries		$132,103	$144,667	$23,451	$23,653	$108,652	$121,015	$3,921,561	$4,076,076	832.8	885.7	17,759	18,102
Distribution by industry:													
Manufacturing 1/		100,067	111,864	18,831	20,020	81,236	91,845	2,756,605	2,765,725	(D)	(D)	11,220	11,347
Food and kindred products	20	(D)	(D)	0	1	(D)	(D)	(D)	330,963	(D)	(D)	(D)	1,033
Tobacco products	21	(D)	(D)	0	0	(D)	(D)	(D)	19,630	(D)	(D)	(D)	57
Textile mill products	22	(D)	(D)	(D)	(D)	276	303	29,625	38,592	2.2	2.6	281	332
Apparel	23	(D)	(D)	(D)	(D)	106	113	12,852	12,946	1.6	1.2	107	102
Lumber and wood products, except furniture	24	(D)	(D)	(D)	(D)	84	55	12,056	15,502	0.7	0.6	74	94
Furniture and fixtures	25	(D)	(D)	(D)	(D)	145	598	19,913	31,734	2.2 (S)	3.0 (S)	160	245
Paper and allied products	26	(D)	(D)	(D)	(D)	1,404	1,558	138,086	134,607	11.0 (S)	11.5 (S)	547	568
Printing, publishing, and allied industries	27	(D)	(D)	(D)	(D)	306	325	39,781	35,739	3.3 (S)	3.4 (S)	341	303
Chemicals and allied products	28	17,547	(D)	210 S)	(D)	17,337	17,698	371,302	335,642	94.3	91.8	1,211	1,069
Petroleum refining and extraction	13,29	1,760	1,662	6	24	1,754	1,638	245,662	249,436	8.4	9.1	324	288
Rubber products	30	(D)	(D)	(D)	(D)	1,210	1,334	76,816	74,124	10.2	11.5	485	472
Leather and leather products	31	(D)	(D)	(D)	(D)	40	41	6,534	13,463	0.3	0.3	37	48
Stone, clay, and glass products	32	448	517	6	5	441	512	30,363	38,899	3.9	4.4	173	197
Primary metals	33	593	(D)	13	(D)	580	637	115,664	103,908	4.1	5.5 (S)	465	406
Fabricated metal products	34	1,023	(D)	86	(D)	937	1,460	89,012	98,175	9.1	11.0	593	617
Machinery	35	(D)	13,685	(D)	117	9,676	13,568	269,689	264,217	87.3	92.0	1,172	1,355
Electrical equipment	36	18,751	22,826	1,690	2,176	17,060	20,650	315,070	338,164	125.8	140.8	1,384	1,430
Transportation	37	32,441	32,810	13,130	12,203	19,311	20,607	532,826	501,357	156.6	162.8 (S)	2,009	1,957
Professional and scientific instruments	38	11,976	13,091	3,460 S)	4,393	8,516	8,698	116,696	111,499	70.9 (S)	72.9 (S)	710	641
Miscellaneous manufacturing industries 2/	39	(D)	490	(D)	3	488	488	20,819	17,128	4.6	5.0	134	133

See explanatory information and SOURCE at end of table.

[illegible] companies, by detailed industry and size of company, 1995–96

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Industry and size of company	SIC code	Research and development funds						Domestic net sales		R&D scientists and engineers		Domestic employment	
		Total		Federal		Company				January 3/		March	
		1995	1996	1995	1996	1995	1996	1995	1996	1996	1997	1995	1996
		[Dollars in millions]								[In thousands]			
Distribution by industry:													
Nonmanufacturing 1/		$32,036	$32,803	$4,620	$3,633	$27,415	$29,170	$1,164,955	$1,310,352	226.6	245.8	6,538	6,755
Agricultural services	07–09	NA	44	NA	0	NA	44	NA	1,068	0.5	0.4	NA	12
Mining	10–14	NA	77	NA	8	NA	68	NA	17,693	2.1	0.6	NA	64
Construction	15–17	NA	283	NA	0	NA	283	NA	13,864	2.0	3.3	NA	96
Railroad transportation	40	NA	34	NA	0	NA	34	NA	24,968	0.1	(D)	NA	143
Local and suburban transit and interurban highway passenger transportation	41	NA	0	NA	0	NA	0	NA	0	(D)	(D)	NA	0
Motor freight transportation and warehousing	42	NA	39	NA	0	NA	39	NA	26,267	(D)	(D)	NA	(D)
Water transportation	44	NA	0	NA	0	NA	0	NA	0	(D)	(D)	NA	0
Transportation by air	45	NA	32	NA	12	NA	20	NA	(D)	0.2	0.1 (S)	NA	(D)
Pipelines, except natural gas	46	NA	0	NA	0	NA	0	NA	0	0.0	0.0	NA	0
Transportation services	47	NA	118	NA	0	NA	118	NA	(D)	(D)	(D)	NA	7
Communications	48	(D)	4,103	146	133	4,756	3,970	220,446	211,857	25.4	24.7	895	826
Electric, gas, and sanitary services	49	440	352	93	42	347	311	168,314	182,121	3.2 (S)	4.0 (S)	501	593
Durable goods	50	NA	4,961	NA	37	NA	4,925	NA	104,604	40.1	34.3	NA	384
Nondurable goods	51	NA	901	NA	0	NA	901	NA	68,525	4.5	6.6	NA	171
Building materials, hardware, garden supply and mobile home dealers	52	NA	4	NA	0	NA	4	NA	(D)	(D)	(D)	NA	(D)
General merchandise stores	53	NA	0	NA	0	NA	0	NA	0	0.0	0.0	NA	0
Food stores	54	NA	24	NA	0	NA	24	NA	(D)	(D)	(D)	NA	(D)
Automotive dealers and gasoline service stations	55	NA	0	NA	0	NA	0		0	(D)	(D)		0
Apparel and accessory stores	56	NA	10	NA	0	NA	10	NA	(D)	(D)	(D)	NA	(D)
Home furniture, furnishings and equipment stores	57	NA	78	NA	0	NA	78		(D)	1.0 (S)	0.8 (S)		(D)

See explanatory information and SOURCE at end of table.

[illegible] R&D [illegible] industry and size of company [illegible]

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Industry and size of company	SIC code	Research and development funds						Domestic net sales		R&D scientists and engineers		Domestic employment	
		Total		Federal		Company				January 3/		March	
		1995	1996	1995	1996	1995	1996	1995	1996	1996	1997	1995	1996
		[Dollars in millions]								[In thousands]			
Eating and drinking places	58	NA	$141	NA	$0	NA	$141	NA	$61,807	1.4 (S)	0.4 (S)	NA	683
Miscellaneous retail	59	NA	386	NA	0	NA	386	NA	2,553	0.1	1.8	NA	20
Depository institutions	60	(D)	378	$12	0	$710	378	$105,961	71,801	2.3	4.4	415	327
Nondepository credit institutions	61	NA	88	NA	0	NA	88	NA	6,165	(D)	(D)	NA	16
Security and commodity brokers, dealers and exchanges, and services	62	NA	321	NA	0	NA	321	NA	(D)	(D)	(D)	NA	(D)
Insurance carriers, agents, brokers and services	63,64	NA	445	NA	0	NA	445	NA	210,014	1.0	7.8	NA	343
Real estate; holding and other investment offices	65,67	NA	65	NA	2	NA	62	NA	(D)	0.4	0.9	NA	(D)
Hotels and personal services	701,72	NA	131	NA	0	NA	130	NA	7,591	0.1	0.5	NA	78
Business services	73	$9,293	10,685	612	361	8,681	10,325	91,588	104,899	80.2	89.0	1,258	1,432
Automotive and miscellaneous repair, services and parking	75,76	NA	47	NA	0	NA	47	NA	2,541	0.4	0.4	NA	16
Motion pictures	78	NA	70	NA	0	NA	70	NA	(D)	(D)	(D)	NA	(D)
Amusement and recreation services	79	NA	42	NA	0	NA	42	NA	929	0.5	(D)	NA	(D)
Health services	80	756	845	4	4	753	841	13,485	13,398	5.0	7.9	140	96
Legal services	81	NA	2	NA	0	NA	2	NA	(D)	0.0	(D)	NA	(D)
Social services	83	NA	5	NA	0	NA	5	NA	(D)	(D)	(D)	NA	(D)
Museums, art galleries, and botanical and zoological gardens	84	NA	0	NA	0	NA	0	NA	0	0.0	0.0	NA	0
Engineering and management services	87	7,662	8,064	3,650	3,027	4,011	5,036	98,178	76,673	52.9	50.7	312	520
Miscellaneous services 2/	89	NA	27	NA	7	NA	20	NA	492	0.2 (S)	0.2 (S)	NA	4

See explanatory information and SOURCE at end of table.

[illegible]

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Industry and size of company	SIC code	Research and development funds						Domestic net sales		R&D scientists and engineers		Domestic employment	
		Total		Federal		Company				January 3/		March	
		1995	1996	1995	1996	1995	1996	1995	1996	1996	1997	1995	1996
		[Dollars in millions]								[In thousands]			
Distribution by size of company: [Number of employees]													
Total		$132,103	$144,667	$23,451	$23,653	$108,652	$121,015	$3,921,561	$4,076,076	832.8	885.7	17,759	18,102
Fewer than 500		16,662	20,249	1,978	2,301	14,684	17,948	374,478	339,405	165.1	177.3	1,935	1,831
500 to 999		4,693	4,637	225	219	4,468	4,418	147,062	147,701	36.6	37.7	835	806
1,000 to 4,999		16,960	18,273	798	512	16,162	17,761	615,336	618,426	124.4	131.6	2,735	2,838
5,000 to 9,999		9,532	11,537	243	468	9,289	11,068	466,186	422,915	61.1	82.2	1,916	2,041
10,000 to 24,999		17,071	20,164	1,946	1,031	15,125	19,133	749,478	791,806	97.0	104.9	2,649	2,734
25,000 or more		67,185	69,808	18,261	19,122	48,924	50,686	1,569,021	1,755,822	348.6	351.9 (S)	7,689	7,852

1/ Data for manufacturing industries are shown separately for each two-digit SIC, with the exception of SICs 13 and 29. which are combined. Until 1996, data were not broken down into this level of detail for most nonmanufacturing industries.

2/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for companies in these groups are included with their respective SIC classification for this table. In other tables, they are included in "Other manufacturing industries" and in "Other nonmanufacturing industries."

3/ Data recorded in January represent employment figures for the previous year.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.
NA = Not available.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

[illegible] Total company, Federal, and other funds for industrial R&D performance, by industry and size of company: 1986–96

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Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
		[Dollars in millions]										
All industries		$87,823	$92,155	$97,015	$102,055	$109,727	$116,952	$119,110	$117,400	$119,595	$132,103	$144,667
Distribution by industry:												
Manufacturing		80,377	84,311	86,503	88,024	88,934	88,506	90,177	86,569	90,749	100,067	111,864
Food, kindred, and tobacco products	20,21	(D)	1,206	(D)	(D)	(D)	1,277	1,386	1,345	1,476	1,566	1,564
Textiles and apparel	22,23	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Lumber, wood products, and furniture	24,25	144	137	(D)	192	216	(D)	(D)	(D)	(D)	(D)	(D)
Paper and allied products	26	(D)	(D)	(D)	879	1,059	(D)	(D)	(D)	(D)	(D)	(D)
Chemicals and allied products	28	8,843	9,635	11,067	12,069	13,291	14,648	15,381	(D)	(D)	17,547	(D)
Industrial chemicals	281–82,286	3,552	3,716	4,172	4,451	5,010	5,390	5,165	(D)	(D)	(D)	(D)
Drugs and medicines	283	3,658	(D)	4,906	(D)	(D)	(D)	7,944	9,146	9,633	10,215	9,773
Other chemicals	284–85,287–89	1,633	(D)	1,989	(D)	(D)	(D)	2,272	(D)	(D)	(D)	2,505
Petroleum refining and extraction	13,29	(D)	1,897	1,997	2,180	2,306	2,498	2,277	2,152	1,950	1,760	1,654
Rubber products	30	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Stone, clay, and glass products	32	950	995	(D)	(D)	(D)	(D)	(D)	538	591	448	468
Primary metals	33	(D)	730	637	686	739	714	522	669	690	593	(D)
Ferrous metals and products	331–32,3398–99	(D)	(D)	253	(D)	(D)	(D)	(D)	289	(D)	(D)	(D)
Nonferrous metals and products	333–36	456	(D)	384	(D)	(D)	(D)	(D)	380	(D)	(D)	(D)
Fabricated metal products	34	895	783	881	904	939	974	1,017	1,158	1,111	1,023	(D)
Machinery	35	(D)	(D)	(D)	(D)	14,446	14,775	14,938	8,381	8,110	(D)	13,455
Office, computing, and accounting machines	357	(D)	(D)	(D)	(D)	(D)	(D)	(D)	4,950	4,106	(D)	(D)
Other machinery, except electrical	351–56,358–59	2,396	2,428	2,682	2,729	(D)	(D)	(D)	3,431	4,004	5,041	(D)
Electrical equipment	36	14,980	15,848	14,128	13,318	13,400	13,415	13,380	13,349	15,338	18,751	22,498
Radio and TV receiving equipment	365	133	139	149	96	114	(D)	(D)	(D)	(D)	(D)	(D)
Communication equipment	366	9,669	10,184	8,427	7,071	5,928	4,787	(D)	(D)	(D)	(D)	(D)
Electronic components	367	(D)	4,286	4,133	4,025	3,914	(D)	3,567	5,311	6,032	(D)	(D)
Other electrical equipment	361–64,369	(D)	1,239	1,419	2,126	3,444	(D)	(D)	(D)	(D)	(D)	(D)
Transportation equipment	37	31,275	34,246	34,775	33,859	31,361	27,428	27,494	27,258	28,087	32,441	32,737
Motor vehicles and motor vehicles equipment	371	(D)	(D)	(D)	(D)	(D)	(D)	(D)	11,718	(D)	(D)	(D)
Other transportation equipment	373–75,379	(D)	(D)	(D)	(D)	(D)	(D)	(D)	483	(D)	(D)	(D)
Aircraft and missiles	372,376	21,050	24,458	24,168	22,331	20,635	16,629	17,158	15,056	14,260	16,951	16,224

See explanatory information and SOURCE at end of table.

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Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
		[Dollars in millions]										
Distribution by industry:												
Professional and scientific instruments	38	$5,103	$5,222	$5,530	$5,992	$7,055	$8,705	$9,542	$10,119	$11,441	$11,976	$12,149
Scientific and mechanical measuring instruments	381–82	(D)	(D)	1,959	2,366	3,346	(D)	5,156	5,681	6,952	7,146	(D)
Optical, surgical, photographic, and other instruments	384–87	(D)	(D)	3,571	3,626	3,709	(D)	4,386	4,438	4,489	4,831	(D)
Other manufacturing industries 1/	27,31,39	382	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Nonmanufacturing 2/		7,446	7,844	10,513	14,031	20,793	28,446	28,933	30,831	28,846	32,036	32,803
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA	5,435	4,678
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA	59	73
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	440	352
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Trade	50–59	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	6,389
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Services	701,72,73, 75–81, 83, 84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	17,876	19,022
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	9,293	10,641
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA	9,059	(D)
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA	234	(D)
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA	756	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	715 (S)
Other health services	802–805, 808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	7,662	7,318
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA	2,933	1,660
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	5,484
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	173

See explanatory information and SOURCE at end of table.

Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
		[Dollars in millions]										
Distribution by industry:												
Other services	701,72,75–79, 81,83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	$165	(D)
Other nonmanufacturing industries 1/	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA	413	(D)
Distribution by size of company: [Number of employees]												
Total		$87,823	$92,155	$97,015	$102,055	$109,727	$116,952	$119,110	$117,400	$119,595	132,103	$144,667
Fewer than 500		7,071	7,163	(S)	7,809	(S)	13,172	13,557	14,620	13,966	16,662	20,249
500 to 999		1,902	1,725	1,669	1,825	2,154	8,000	7,958	3,230	3,608	4,693	4,637
1,000 to 4,999		7,472	7,262	7,622	7,881	8,411	10,453	11,886	13,334	14,617	16,960	18,273
5,000 to 9,999		4,251	4,501	5,245	5,756	6,746	8,049	8,258	9,135	8,912	9,532	11,537
10,000 to 24,999		10,493	12,043	11,506	10,450	12,486	15,770	15,744	15,421	15,972	17,071	20,164
25,000 or more		56,991	59,461	63,694	68,335	71,030	61,508	61,707	61,659	62,519	67,185	69,808

1/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not comparable with statistics for prior years.

2/ Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.
NA = Not available.

NOTE: As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

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Table A-4. Total (company, Federal, and other) funds for industrial R&D performance, by industry, and size of company, 1996

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Industry	SIC code	Total	Size of company: Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars in millions]					
All Industries		$144,667	$20,249	$4,637	$18,273	$11,537	$20,164	$69,808
Distribution by industry:								
Manufacturing		111,864	8,092	2,898	13,568	9,079	16,566	61,662
Food, kindred, and tobacco products	20,21	1,564	58	53	217	338	246	651
Textiles and apparel	22,23	(D)	60	39	173	27	112	(D)
Lumber, wood products, and furniture	24,25	(D)	53	21	38	68	(D)	(D)
Paper and allied products	26	(D)	16	20	230	70	354	(D)
Chemicals and allied products	28	(D)	503	288	3,384	2,491	(D)	4,720
Industrial chemicals	281–82,286	(D)	192	154	1,203	607	2,467	(D)
Drugs and medicines	283	9,773	125	76	1,661	1,564	3,614	2,732
Other chemicals	284–85,287–89	2,505	185	58	520	320	(D)	(D)
Petroleum refining and extraction	13,29	1,654	42	(D)	59	(D)	674	843
Rubber products	30	(D)	153	121	350	241	206	(D)
Stone, clay, and glass products	32	468	21	28	88	96	235	0
Primary metals	33	(D)	50	19	129	105	(D)	(D)
Ferrous metals and products	331–32,3398–99	(D)	19	(D)	64	65	(D)	(D)
Nonferrous metals and products	333–36	(D)	31	(D)	65	39	(D)	(D)
Fabricated metal products	34	(D)	187	102	187	95	458	(D)
Machinery	35	13,455	1,183	(D)	2,023	2,061	3,690	(D)
Office, computing, and accounting machines	357	(D)	404	(D)	718	1,153	2,324	(D)
Other machinery, except electrical	351–56,358–59	(D)	779	365	1,305	908	1,366	(D)
Electrical equipment	36	22,498	2,298	749	4,049	1,498	2,036	11,869
Radio and TV receiving equipment	365	(D)	23	11	(D)	(D)	0	0
Communication equipment	366	(D)	765	211	1,243	(D)	(D)	(D)
Electronic components	367	(D)	849	342	(D)	863	643	8,901
Other electrical equipment	361–64,369	(D)	661	185	502	136	(D)	(D)

See explanatory information and SOURCE at end of table.

[illegible] and other funds for industrial R&D performance, by industry, and [illegible] company, 1996

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Industry	SIC code	Total	Size of company: Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars in millions]					
Distribution by industry:								
Transportation equipment	37	$32,737	$57	$116	$390	$812	$438	$30,923
Motor vehicles and motor vehicles equipment	371	(D)	(D)	(D)	147	(D)	325	15,036
Other transportation equipment	373–75,379	(D)	(D)	0	114	(D)	(D)	399
Aircraft and missiles	372,376	16,224	49	(D)	129	408	(D)	15,488
Professional and scientific instruments	38	12,149	1,088	723	2,079	(D)	(D)	6,806
Scientific and mechanical measuring instruments	381–82	(D)	685	547	1,000	(D)	(D)	(D)
Optical, surgical, photographic, and other instruments	384–87	(D)	403	176	1,079	700	(D)	(D)
Other manufacturing industries 1/	27,31,39	(D)	2,322	(D)	171	242	138	51
Nonmanufacturing		32,803	12,157	1,739	4,705	2,458	3,597	8,146
Transportation and utilities	40–42,44–49	4,678	190	(D)	137	(D)	106	4,136
Communications	48	(D)	39	(D)	(D)	(D)	0	4,016
Telephone communications	481	(D)	0	0	0	(D)	0	4,016
Other communications	482–484,489	73	39	(D)	(D)	0	0	0
Electric, gas, and sanitary services	49	352	24	(D)	95	81	(D)	(D)
Other transportation and utilities	40–42,44–47	(D)	127	0	(D)	(D)	(D)	(D)
Trade	50–59	6,389	2,151	277	1,107	572	(D)	(D)
Finance, insurance, and real estate	60–65,67	(D)	79	7	289	211	(D)	427
Services	701,72,73,75–81, 83,84,87,89	19,022	8,579	(D)	3,054	1,534	3,039	(D)
Business services	73	10,641	3,378	907	2,697	1,475	2,138	45
Computer and data processing services	737	(D)	3,276	878	2,641	(D)	(D)	(D)
Other business services	731–736,738	(D)	102	29	56	(D)	(D)	(D)
Health services	80	(D)	77	(D)	32	(D)	(D)	0
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	715 (S)	72	(D)	(D)	0	(D)	0
Other health services	802–805,808–809	(D)	5	(D)	(D)	(D)	0	0

See explanatory information and SOURCE at end of table.

[illegible] Total (company, Federal, and other) funds for industrial R&D performance, by industry and size of company: 1996

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Industry	SIC code	Total	Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			Size of company					
			[Dollars in millions]					
Distribution by industry:								
Engineering and management services	87	$7,318	$5,074	$501	$268	(D)	(D)	(D)
Engineering, architectural, and surveying	871	1,660	1,155	(D)	203	(D)	(D)	$0
Research, development, and testing	873	5,484	3,831	416	3	$0	(D)	(D)
Other engineering and management services	872,874	173	88	(D)	62	0	(D)	0
Other services	701,72,75–79,81, 83,84,89	(D)	50	8	56	(D)	(D)	(D)
Other nonmanufacturing industries 1/	07–12,14,15, 161–162,17	(D)	1,158	17	118	44	(D)	(D)

1/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

[illegible] by industry, size of company, and size of R&D program: 1996

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Industry and size of company	SIC code	Total	Size of R&D program Less than $200,000	$200,000 to $999,999	$ 1 million to $9.9 million	$ 10 million to $99.9 million	$100 million or more
			[Dollars in millions]				
All Industries		$144,667	$1,160	$3,517	$15,068	$25,460	$99,463
Distribution by industry:							
Manufacturing		111,864	719	1,910	7,877	16,184	85,174
Food, kindred, and tobacco products	20,21	1,564	(D)	49	261	800	(D)
Textiles and apparel	22,23	(D)	(D)	49	134	214	0
Lumber, wood products, and furniture	24,25	(D)	16	31	54	113	(D)
Paper and allied products	26	(D)	(D)	(D)	244	450	(D)
Chemicals and allied products	28	(D)	(D)	(D)	575	2,813	14,529
Industrial chemicals	281–82,286	(D)	0	(D)	(D)	1,232	4,183
Drugs and medicines	283	9,773	(D)	0	(D)	854	8,860
Other chemicals	284–85,287–89	2,505	12	56	224	727	1,485
Petroleum refining and extraction	13,29	1,654	0	(D)	(D)	274	1,304
Rubber products	30	(D)	(D)	75	330	469	492
Stone, clay, and glass products	32	468	(D)	10	63	284	(D)
Primary metals	33	(D)	9	25	158	242	(D)
Ferrous metals and products	331–32,3398–99	(D)	(D)	(D)	72	121	0
Nonferrous metals and products	333–36	(D)	(D)	(D)	85	121	(D)
Fabricated metal products	34	(D)	61	103	324	405	(D)
Machinery	35	13,455	53	236	1,354	2,442	9,371
Office, computing, and accounting machines	357	(D)	0	(D)	315	531	7,323
Other machinery, except electrical	351–56,358–59	(D)	53	(D)	1,039	1,911	2,048
Electrical equipment	36	22,498	48	150	1,840	3,816	16,645
Radio and TV receiving equipment	365	(D)	(D)	4	32	102	0
Communication equipment	366	(D)	(D)	31	468	1,065	3,272
Electronic components	367	(D)	(D)	22	739	1,731	11,310
Other electrical equipment	361–64,369	(D)	(D)	93	601	918	2,063

See explanatory information and SOURCE at end of table.

[illegible] industry, size of company, and size of R&D program: 1996

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Industry and size of company	SIC code	Total	Size of R&D program Less than $200,000	$200,000 to $999,999	$ 1 million to $9.9 million	$ 10 million to $99.9 million	$100 million or more
			[Dollars in millions]				
Distribution by industry:							
Transportation equipment	37	$32,737	$5	(D)	$201	$973	(D)
Motor vehicles and motor vehicles equipment	371	(D)	(D)	$0	93	498	$15,355
Other transportation equipment	373–75,379	(D)	(D)	(D)	(D)	171	(D)
Aircraft and missiles	372,376	16,224	0	(D)	(D)	305	15,847
Professional and scientific instruments	38	12,149	$16	$112	$1,113	$2,537	$8,370
Scientific and mechanical measuring instruments	381–82	(D)	(D)	52	623	1,343	5,064
Optical, surgical, photographic, and other instruments	384–87	(D)	(D)	60	490	1,194	3,307
Other manufacturing industries 1/	27,31,39	(D)	421	898	1,183	352	(D)
Nonmanufacturing		32,803	441	1,607	7,191	9,276	14,289
Transportation and utilities	40–42,44–49	4,678	(D)	40	330	472	(D)
Communications	48	(D)	(D)	2	57	(D)	(D)
Telephone communications	481	(D)	0	0	(D)	190	(D)
Other communications	482–484,489	73	(D)	2	(D)	(D)	0
Electric, gas, and sanitary services	49	352	2	24	142	184	0
Other transportation and utilities	40–42,44–47	(D)	0	14	130	(D)	0
Trade	50–59	6,389	94	271	1,772	1,142	3,110
Finance, insurance, and real estate	60–65,67	(D)	(D)	43	277	461	(D)
Services	701,72,73,75–81, 83,84,87,89	19,022	119	601	4,448	7,004	6,849
Business services	73	10,641	81	333	2,281	3,523	4,423
Computer and data processing services	737	(D)	(D)	290	2,170	3,416	4,423
Other business services	731–736,738	(D)	(D)	43	111	107	0
Health services	80	(D)	12	23	54	(D)	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	715 (S)	(D)	(D)	45	(D)	(D)
Other health services	802–805,808–809	(D)	(D)	(D)	8	(D)	0

See explanatory information and SOURCE at end of table.

Industry and size of company	SIC code	Total	Size of R&D program: Less than $200,000	$200,000 to $999,999	$ 1 million to $9.9 million	$ 10 million to $99.9 million	$100 million or more
			[Dollars in millions]				
Engineering and management services	87	$7,318	(D)	$218	$2,057	(D)	$1,692 (S)
Engineering, architectural, and surveying	871	1,660	(D)	90	711	$682	(D)
Research, development, and testing	873	5,484	(D)	56	1,270	2,628	(D)
Other engineering and management services	872,874	173	(D)	72	75	(D)	0
Other services	701,72,75–79,81, 83,84,89	(D)	$9	28	57	115	(D)
Other nonmanufacturing industries 1/	07–12,14,15, 161–162,17	(D)	(D)	651	364	197	$0
Distribution by size of company: [Number of employees]							
Total		144,667	1,160	3,517	15,068	25,460	99,463
Fewer than 500		20,249	1,126	3,232	10,440	5,451	0
500 to 999		4,637	(D)	160	1,619	2,527	(D)
1,000 to 4,999		18,273	15	92	2,361	9,461	6,345
5,000 to 9,999		11,537	1	19	352	3,638	7,526
10,000 to 24,999		20,164	(D)	9	188	2,780	(D)
25,000 or more		69,808	0	4	109	1,603	68,092

1/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

[redacted]

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Industry and size of company	SIC code	Total	Size of R&D program: Less than $200,000	$200,000 to $999,999	$ 1 million to $9.9 million	$ 10 million to $99.9 million	$100 million or more
		[Number of companies]					
All industries		34,569	19,972	8,020	5,481	919	177
Distribution by industry:							
Manufacturing		19,090	11,191	4,329	2,856	576	138
Food, kindred, and tobacco products	20,21	645	375	133	109	26	2
Textiles and apparel	22,23	451	275	117	48	11	0
Lumber, wood products, and furniture	24,25	429	331	64	24	8	2
Paper and allied products	26	197	100	7	71	16	2
Chemicals and allied products	28	618	200	134	166	84	34
Industrial chemicals	281–82,286	169	0	50	72	34	12
Drugs and medicines	283	100	50	0	9	23	18
Other chemicals	284–85,287–89	349	150	84	84	27	4
Petroleum refining and extraction	13,29	124	0	100	9	9	6
Rubber products	30	558	222	190	123	19	3
Stone, clay, and glass products	32	248	189	21	27	10	1
Primary metals	33	231	102	66	49	12	2
Ferrous metals and products	331–32,3398–99	137	50	61	19	7	0
Nonferrous metals and products	333–36	94	52	5	29	5	2
Fabricated metal products	34	1,005	627	251	111	14	2
Machinery	35	1,875	765	558	446	84	22
Office, computing, and accounting machines	357	151	0	31	86	20	14
Other machinery, except electrical	351–56,358–59	1,724	765	527	360	64	8
Electrical equipment	36	1,497	495	312	510	152	28
Radio and TV receiving equipment	365	51	29	6	13	3	0
Communication equipment	366	290	54	66	117	43	9
Electronic components	367	588	234	68	209	62	15
Other electrical equipment	361–64,369	569	179	172	171	44	4

See explanatory information and SOURCE at end of table.

Table A-13. Number of R&D-performing companies, by industry, size of company, and size of R&D program: 1996

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Industry and size of company	SIC code	Total	Size of R&D program: Less than $200,000	$200,000 to $999,999	$ 1 million to $9.9 million	$ 10 million to $99.9 million	$100 million or more
		[Number of companies]					
Distribution by industry:							
Transportation equipment	37	346	150	52	95	30	19
Motor vehicles and motor vehicles equipment	371	179	100	0	54	19	6
Other transportation equipment	373–75,379	94	50	2	36	4	2
Aircraft and missiles	372,376	73	0	50	5	7	11
Professional and scientific instruments	38	877	172	228	376	86	14
Scientific and mechanical measuring instruments	381–82	468	77	109	224	51	7
Optical, surgical, photographic, and other instruments	384–87	409	95	119	152	35	7
Other manufacturing industries 1/	27,31,39	9,990	7,189	2,093	693	14	1
Nonmanufacturing		15,479	8,781	3,692	2,625	343	39
Transportation and utilities	40–42,44–49	274	32	104	116	17	4
Communications	48	38	1	4	22	7	4
Telephone communications	481	11	0	0	1	6	4
Other communications	482–484,489	27	1	4	21	1	0
Electric, gas, and sanitary services	49	122	31	48	37	6	0
Other transportation and utilities	40–42,44–47	114	0	53	57	4	0
Trade	50–59	2,950	1,400	774	725	39	12
Finance, insurance, and real estate	60–65,67	308	102	109	83	11	3
Services	701,72,73,75–81, 83,84,87,89	4,896	1,834	1,355	1,418	270	20
Business services	73	2,750	1,029	772	810	126	13
Computer and data processing services	737	2,366	817	659	755	121	13
Other business services	731–736,738	384	211	113	55	5	0
Health services	80	351	261	68	18	2	2
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	317	232	67	14	1	2
Other health services	802–805,808–809	34	29	1	4	1	0

See explanatory information and SOURCE at end of table.

[illegible]

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Industry and size of company	SIC code	Total	Size of R&D program: Less than $200,000	$200,000 to $999,999	$ 1 million to $9.9 million	$ 10 million to $99.9 million	$100 million or more
		[Number of companies]					
Distribution by industry:							
Engineering and management services	87	1,413	244	451	575	138	4
Engineering, architectural, and surveying	871	593	146	203	221	23	1
Research, development, and testing	873	661	83	120	342	113	3
Other engineering and management services	872,874	159	16	129	12	2	0
Other services	701,72,75–79,81, 83,84,89	382	300	64	14	3	1
Other nonmanufacturing industries 1/	07–12,14,15, 161–162,17	7,051	5,413	1,349	282	6	0
Distribution by size of company: [Number of employees]							
Total		34,569	19,972	8,020	5,481	919	177
Fewer than 500		31,519	19,592	7,474	4,175	278	0
500 to 999		1,132	213	328	491	99	2
1,000 to 4,999		1,324	156	168	652	309	38
5,000 to 9,999		292	11	31	102	117	32
10,000 to 24,999		175	1	14	38	73	49
25,000 or more		127	0	6	23	42	56

1/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not comparable with statistics for prior years.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

[illegible] Federal funds for industrial R&D performance, by industry and size of company: 1986–96

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Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
		[Dollars in millions]										
All industries		$59,932	$61,403	$66,672	$73,501	$81,602	$90,580	$94,388	$94,591	$97,131	$108,652	$121,015
Distribution by industry:												
Manufacturing		55,192	56,259	59,415	63,199	65,251	67,639	71,025	69,901	73,375	81,236	91,845
Food, kindred, and tobacco products	20,21	1,280	1,204	1,173	1,244	1,248	1,277	1,386	1,345	1,476	1,566	1,564
Textiles and apparel	22,23	246	243	215	(S)	260	236	261	286	316	381	414
Lumber, wood products, and furniture	24,25	144	137	165	192	216	200	234	196	201	229	634
Paper and allied products	26	538	604	752	879	1,059	1,174	1,182	1,191	1,263	1,404	1,534
Chemicals and allied products	28	8,664	9,445	10,828	11,943	13,168	14,439	15,091	16,658	16,559	17,337	17,520
Industrial chemicals	281–82,286	3,374	3,531	3,939	4,340	4,902	5,225	4,911	5,165	4,780	5,139	5,246
Drugs and medicines	283	3,657	4,095	4,900	5,512	5,917	6,947	7,934	9,132	9,625	10,202	9,769
Other chemicals	284–85,287–89	1,633	1,819	1,989	2,091	2,349	2,267	2,246	2,361	2,154	1,996	2,505
Petroleum refining and extraction	13,29	1,971	1,883	1,975	2,162	2,289	2,487	2,268	2,138	1,939	1,754	1,630
Rubber products	30	655	596	718	867	1,056	(D)	1,256	1,059	1,432	1,210	1,269
Stone, clay, and glass products	32	941	985	697	615	538	455	479	529	553	441	463
Primary metals	33	786	711	620	666	717	706	514	646	672	580	637
Ferrous metals and products	331–32,3398–99	336	249	252	244	231	225	221	272	241	217	214
Nonferrous metals and products	333–36	450	462	368	422	486	481	293	374	431	363	422
Fabricated metal products	34	800	633	718	726	736	748	723	936	868	937	1,322
Machinery	35	10,701	10,577	11,929	13,342	13,575	13,720	13,903	8,295	8,011	9,676	13,338
Office, computing, and accounting machines	357	8,380	8,193	9,347	10,725	10,988	10,419	10,614	4,917	4,078	4,699	8,132
Other machinery, except electrical	351–56,358–59	2,321	2,384	2,582	2,618	2,587	3,301	3,289	3,378	3,933	4,976	5,206
Electrical equipment	36	9,767	10,449	9,975	9,575	9,267	8,865	9,516	11,682	13,537	17,060	20,356
Radio and TV receiving equipment	365	133	139	149	96	114	(D)	93	87	64	114	140
Communication equipment	366	5,117	5,455	4,798	4,159	3,584	(S)	3,381	3,954	4,939	3,845	4,359
Electronic components	367	3,357	3,630	3,684	3,655	3,496	3,177	3,320	5,105	5,870	9,628	12,497
Other electrical equipment	361–64,369	1,160	1,225	1,345	1,664	2,073	(D)	2,722	2,537	2,664	3,473	3,360
Transportation equipment	37	13,567	13,462	13,910	14,596	14,264	14,858	16,292	16,640	17,695	19,311	20,535
Motor vehicles and motor vehicles equipment	371	7,171	7,167	7,783	8,756	8,594	9,063	9,132	10,659	11,950	13,590	14,528
Other transportation equipment	373–75,379	330	356	361	337	283	262	289	297	279	232	298
Aircraft and missiles	372,376	6,066	5,939	5,766	5,503	5,387	5,533	6,671	5,684	5,466	5,489	5,710

See explanatory information and SOURCE at end of table.

[illegible] Federal funds for industrial R&D performance by industry and size of company: [illegible]

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Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
		[Dollars in millions]										
Distribution by industry:												
Professional and scientific instruments	38	$4,752	$4,950	$5,339	$5,729	$6,318	$6,840	$7,321	$7,542	$8,058	$8,516	$8,207
Scientific and mechanical measuring instruments	381–82	1,521	1,598	1,863	2,205	2,696	3,017	3,013	3,196	3,687	3,787	3,283
Optical, surgical, photographic, and other instruments	384–87	3,231	3,352	3,476	3,524	3,621	3,823	4,308	4,346	4,371	4,729	4,924
Other manufacturing industries 1/	27,31,39	380	380	401	438	541	(D)	599	758	796	835	2,423
Nonmanufacturing 2/		4,740	5,144	7,257	10,302	16,351	22,941	23,363	24,690	23,756	27,415	29,170
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA	5,183	4,492
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	4,756	3,970
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	4,697	3,897
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA	59	73
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	347	311
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA	80	211
Trade	50–59	NA	NA	NA	NA	NA	NA	NA	NA	NA	7,514	6,338
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA	710	1,280
Services	701,72,73, 75–81,83, 84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	13,606	15,904
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	8,681	10,280
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA	8,545	10,025
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA	136	255
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA	753	735 (S)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA	737	713 (S)
Other health services	802–805, 808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA	16 (S)	23

See explanatory information and SOURCE at end of table.

[illegible] except Federal funds for industrial R&D performance, by industry, and size of company: 1986–96

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Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
		[Dollars in millions]										
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	$4,011	$4,572
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,050	667
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA	2,829	3,776
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA	132	129
Other services	701,72,75–79, 81,83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	160	317
Other nonmanufacturing industries 1/	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA	402	1,156
Distribution by size of company: [Number of employees]												
Total		$59,932	$61,403	$66,672	$73,501	$81,602	$90,580	$94,388	$94,591	$97,131	$108,652	$121,015
Fewer than 500		6,203	6,200	(S)	(S)	(S)	11,285	11,532	13,006	12,802	14,684	17,948
500 to 999		1,765	1,610	1,748	1,934	2,144	7,819	7,807	3,048	3,426	4,468	4,418
1,000 to 4,999		6,243	6,281	6,820	7,546	8,363	9,403	10,865	12,219	13,533	16,162	17,761
5,000 to 9,999		3,455	3,753	4,075	4,509	4,997	7,233	7,495	8,371	8,087	9,289	11,068
10,000 to 24,999		8,489	9,681	10,512	11,631	12,890	12,397	12,328	12,606	13,625	15,125	19,133
25,000 or more		33,777	33,878	36,785	40,703	45,106	42,443	44,361	45,340	45,658	48,924	50,686

1/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not directly comparable with statistics for prior years.

2/ Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.
NA = Not available.

NOTES: Company-funded R&D includes funds for industrial R&D performed within company facilities from all sources except the Federal Government. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Company-financed R&D not performed within the company is excluded.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

[redacted]

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Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[Dollars in millions]						
All Industries		$121,015	$17,948	$4,418	$17,761	$11,068	$19,133	$50,686
Distribution by industry:								
Manufacturing		91,845	7,421	2,807	13,367	8,633	15,716	43,901
Food, kindred, and tobacco products	20,21	1,564	58	53	217	338	246	651
Textiles and apparel	22,23	414	60	39	173	26	(D)	(D)
Lumber, wood products, and furniture	24,25	634	43	21	38	68	(D)	(D)
Paper and allied products	26	1,534	16	20	230	70	354	844 (S)
Chemicals and allied products	28	17,520	501	288	3,376	2,485	6,314	4,556
Industrial chemicals	281–82,286	5,246	192	154	1,197	601	(D)	(D)
Drugs and medicines	283	9,769	123	76	1,660	1,564	3,614	2,732
Other chemicals	284–85,287–89	2,505	185	58	520	320	(D)	(D)
Petroleum refining and extraction	13,29	1,630	(D)	(D)	59	(D)	673	839
Rubber products	30	1,269	153	121	348	(D)	206	(D)
Stone, clay, and glass products	32	463	20	28	84	96	235	0
Primary metals	33	637	50	(D)	129	101	153	(D)
Ferrous metals and products	331–32,3398–99	214	19	(D)	64	61	(D)	(D)
Nonferrous metals and products	333–36	422	31	(D)	65	39	(D)	(D)
Fabricated metal products	34	1,322	186	101	175	(D)	418	(D)
Machinery	35	13,338	(D)	575	2,017	2,048	3,662	(D)
Office, computing, and accounting machines	357	8,132	(D)	211 (S)	718	1,145	2,324	(D)
Other machinery, except electrical	351–56,358–59	5,206	(D)	365	1,299	903	1,338	(D)
Electrical equipment	36	20,356	2,244	733	3,964	1,493	2,025	9,896
Radio and TV receiving equipment	365	140	23	11	(D)	(D)	0	0
Communication equipment	366	4,359	743	208	1,238	(D)	(D)	(D)
Electronic components	367	12,497	821	330	2,161	863	632	7,691
Other electrical equipment	361–64,369	3,360	656	185	(D)	136	(D)	(D)

See explanatory information and SOURCE at end of table.

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[Dollars in millions]						
Distribution by industry:								
Transportation equipment	37	$20,535	$51	$101	$382	$521	$424	$19,056
Motor vehicles and motor vehicles equipment	371	14,528	(D)	(D)	143	361	325	13,618
Other transportation equipment	373–75,379	298	(D)	0	114	(D)	(D)	175
Aircraft and missiles	372,376	5,710	(D)	(D)	125	(D)	(D)	5,263
Professional and scientific instruments	38	8,207	1,046	663	2,003	(D)	(D)	3,173
Scientific and mechanical measuring instruments	381–82	3,283	649	494	929	(D)	(D)	(D)
Optical, surgical, photographic, and other instruments	384–87	4,924	397	170	1,074	699	(D)	(D)
Other manufacturing industries 1/	27,31,39	2,423	1,790	37	171	242	138	47
Nonmanufacturing		29,170	10,527	1,612	4,395	2,435	3,417	6,785
Transportation and utilities	40–42,44–49	4,492	190	(D)	121	(D)	105	3,980
Communications	48	3,970	39	(D)	(D)	(D)	0	(D)
Telephone communications	481	3,897	0	0	0	(D)	0	(D)
Other communications	482–484,489	73	39	(D)	(D)	0	0	0
Electric, gas, and sanitary services	49	311	24	(D)	90	68	(D)	(D)
Other transportation and utilities	40–42,44–47	211	127	0	(D)	(D)	(D)	74
Trade	50–59	6,338	2,146	277	1,107	572	(D)	(D)
Finance, insurance, and real estate	60–65,67	1,280	77	7	289	211	(D)	(D)
Services	701,72,73,75–81, 83,84,87,89	15,904	7,226	1,298	2,760	1,528	2,860	232
Business services	73	10,280	3,126	887	2,611	1,475	2,138	44
Computer and data processing services	737	10,025	3,032	862	2,555	(D)	(D)	(D)
Other business services	731–736,738	255	93	24	56	(D)	(D)	(D)

See explanatory information and SOURCE at end of table.

Ta[illegible] company and other (except Federal) funds for industrial R&D performance, by industry and size of company: 1996

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Industry	SIC code	Total	Size of company: Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[Dollars in millions]						
Distribution by industry:								
Health services	80	$735 (S)	$75	(D)	$32	(D)	(D)	$0
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	713 (S)	72	(D)	(D)	$0	(D)	0
Other health services	802–805,808–809	23	4	(D)	(D)	(D)	$0	0
Engineering and management services	87	4,572	3,982	(D)	60	(D)	28	(D)
Engineering, architectural, and surveying	871	667	541	$33	38	(D)	(D)	0
Research, development, and testing	873	3,776	3,355	(D)	(D)	0	(D)	(D)
Other engineering and management services	872,874	129	85	20	(D)	0	(D)	0
Other services	701,72,75–79,81, 83,84,89	317	43	8	56	(D)	(D)	(D)
Other nonmanufacturing industries 1/	07–12,14,15, 161–162,17	1,156	888	17	118	40	(D)	(D)

1/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

[illegible]

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Industry and size of company	SIC code	1991	1993	1994	1995	1996
		[Dollars in millions]				
All industries		$3,319	$3,462	$3,618	$5,177	$5,833
Distribution by industry						
Manufacturing		2,577	2,339	2,450	3,812	4,293
Food, kindred, and tobacco products	20,21	44	43	43	41	50
Textiles and apparel	22,23	(D)	2	4	1	3
Lumber, wood products, and furniture	24,25	(D)	8	8	7	(D)
Paper and allied products	26	12	5	4	14	4
Chemicals and allied products	28	1,087	1,117	1,239	2,386	2,537
Industrial chemicals	281–82,286	95	43	38	259	229
Drugs and medicines	283	771	942	1,055	1,751	2,098
Other chemicals	284–85,287–89	221	132	146	376	210
Petroleum refining and extraction	13,29	35	56	52	32	24
Rubber products	30	18	65	22	32	36
Stone, clay, and glass products	32	(D)	2	6	2	9
Primary metals	33	24	12	15	13	16
Ferrous metals and products	331–32,3398–99	4	8	10	5	4
Nonferrous metals and products	333–36	20	4	5	8	11
Fabricated metal products	34	3	21	21	10	28
Machinery	35	256	125	200	201	330
Office, computing, and accounting machines	357	229	52	113	84	220
Other machinery, except electrical	351–56,358–59	27	73	87	117	110
Electrical equipment	36	114	143	116	194	178
Radio and TV receiving equipment	365	0	(D)	1	2	(D)
Communication equipment	366	63	20	38	40	(D)
Electronic components	367	38	24	24	75	88
Other electrical equipment	361–64,369	13	(D)	54	77	54
Transportation equipment	37	687	(D)	591	(D)	(D)
Motor vehicles and motor vehicles equipment	371	(D)	(D)	(D)	(D)	(D)
Other transportation equipment	373–75,379	(S)	(D)	(D)	5	(D)
Aircraft and missiles	372,376	(D)	52	83	72	(D)

See explanatory information and SOURCE at end of table.

[illegible]

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Industry and size of company	SIC code	1991	1993	1994	1995	1996
		[Dollars in millions]				
Distribution by industry						
Professional and scientific instruments	38	(D)	$189	$57	$114	$55
Scientific and mechanical measuring instruments	381–82	$4	25	16	45	8
Optical, surgical, photographic, and other instruments	384–87	(D)	163	40	68	47
Other manufacturing industries 1/	27,31,39	2	(D)	72	(D)	26
Nonmanufacturing 2/		742	1,123	1,168	1,365	1,540
Transportation and Utilities	40–42,44–49	NA	NA	NA	509	466
Communications	48	NA	NA	NA	264	230
Telephone communications	481	NA	NA	NA	(D)	(D)
Other communications	482–484,489	NA	NA	NA	(D)	(D)
Electric, gas, and sanitary services	49	NA	NA	NA	219	229
Other transportation and utilities	40–42,44–47	NA	NA	NA	27	6
Trade	50–59	NA	NA	NA	346	217
Finance, insurance, and real estate	60–65,67	NA	NA	NA	92	153 (S)
Services	701,72,73,75–81, 83,84,87,89	NA	NA	NA	416	694
Business services	73	NA	NA	NA	151	226
Computer and data processing services	737	NA	NA	NA	139	224
Other business services	731–736,738	NA	NA	NA	12	2
Health services	80	NA	NA	NA	38	66 (S)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	(D)	(D)
Other health services	802–805,808–809	NA	NA	NA	(D)	(D)
Engineering and management services	87	NA	NA	NA	200	396
Engineering, architectural, and surveying	871	NA	NA	NA	13	22
Research, development, and testing	873	NA	NA	NA	187	373
Other engineering and management services	872,874	NA	NA	NA	0	0

See explanatory information and SOURCE at end of table.

[illegible] R&D [illegible] by R&D-performing companies [illegible]
[illegible] 1995, and 1996

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Industry and size of company	SIC code	1991	1993	1994	1995	1996
		[Dollars in millions]				
Distribution by industry						
Other services	701,72,75–79,81, 83,84,89	NA	NA	NA	27	6
Other nonmanufacturing industries 1/	07–12,14,15, 161–162,17	NA	NA	NA	1	10
Distribution by size of company: **[Number of employees]**						
Total		$3,319	$3,462	$3,618	$5,177	$5,833
Fewer than 500		(S)	751	724	674	699
500 to 999		35	107	126	174	161 (S)
1,000 to 4,999		275	310	397	632	632
5,000 to 9,999		218	327	408	393	761
10,000 to 24,999		881	468	391	786	1,458
25,000 or more		1,762	1,497	1,574	2,518	2,121

1/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for Other manufacturing industries and for Other nonmanufacturing industries for 1996 are not comparable with statistics for prior years.

2/ Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.
NA = Not available.

NOTE: As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

[illegible] R&D performing companies contracting R&D [illegible] organizations and [illegible] R&D performing companies, by industry [illegible] 1995

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Industry	SIC code	Total		Size of company											
				Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside
All industries		34,569	3,259	31,519	2,771	1,132	145	1,324	191	292	69	175	50	127	33
Manufacturing		19,090	1,906	16,846	1,573	862	122	973	123	202	39	131	30	76	19
Food, kindred, and tobacco products	20,21	645	25	449	2	63	8	94	4	16	5	11	3	12	2
Textiles and apparel	22,23	451	9	317	2	65	3	51	2	9	2	8	0	1	0
Lumber, wood products, and furniture	24,25	429	14	356	4	23	4	33	3	11	1	4	1	2	0
Paper and allied products	26	197	5	107	0	11	0	57	2	6	1	10	0	6	2
Chemicals and allied products	28	618	132	430	87	52	9	89	18	22	8	17	6	8	4
Industrial chemicals	281–82,286	169	38	94	28	25	4	31	3	8	1	8	2	3	1
Drugs and medicines	283	100	22	58	3	6	1	22	8	5	4	6	4	3	2
Other chemicals	284–85,287–89	349	72	278	56	21	5	37	7	9	3	3	0	2	1
Petroleum refining and extraction	13,29	124	6	104	0	1	0	5	1	1	0	9	3	4	2
Rubber products	30	558	77	389	53	83	14	73	6	7	1	4	2	2	1
Stone, clay, and glass products	32	248	15	200	1	15	7	24	7	5	1	4	0	0	0
Primary metals	33	231	68	163	56	16	1	31	4	13	4	5	2	3	1
Ferrous metals and products	331–32,3398–99	137	10	102	2	3	0	21	2	9	4	2	1	1	1
Nonferrous metals and products	333–36	94	58	61	54	13	1	10	2	4	0	3	1	2	0
Fabricated metal products	34	1,005	147	823	123	91	11	68	8	10	1	11	4	1	0
Machinery	35	1,875	181	1,534	140	109	11	185	18	26	6	18	4	3	2
Office, computing, and accounting machines	357	151	7	114	2	12	0	12	1	7	2	5	1	1	1
Other machinery, except electrical	351–56,358–59	1,724	174	1,420	138	97	11	173	17	19	4	13	3	2	1
Electrical equipment	36	1,497	280	1,178	207	155	43	126	22	18	6	12	1	9	1
Radio and TV receiving equipment	365	51	3	42	2	5	1	3	0	1	0	0	0	0	0
Communication equipment	366	290	45	232	37	27	3	23	4	4	1	1	0	2	0
Electronic components	367	588	111	466	75	61	27	46	7	7	1	4	1	4	0
Other electrical equipment	361–64,369	569	121	437	93	62	12	54	11	6	4	7	0	3	1
Transportation equipment	37	346	12	204	0	52	0	25	5	40	2	10	2	16	3
Motor vehicles and motor vehicles equipment	371	179	6	100	0	51	0	9	2	8	1	7	2	4	1
Other transportation equipment	373–75,379	94	2	52	0	0	0	10	2	28	0	2	0	3	0
Aircraft and missiles	372,376	73	4	52	0	1	0	6	1	4	1	1	0	9	2

See explanatory information and SOURCE at end of table.

Table A-[illegible]. Number of R&D-performing companies contracting R&D performance to outside organizations and total number of R&D-performing companies, by industry and size of company, 1996

Industry	SIC code	Total		Size of company											
				Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside
Professional and scientific instruments	38	877	179	727	154	61	8	72	16	10	0	2	0	5	0
Scientific and mechanical measuring instruments	381–82	468	95	395	89	39	2	27	4	3	0	1	0	3	0
Optical, surgical, photographic, and other instruments	384–87	409	84	332	65	22	6	45	12	7	0	1	0	2	0
Other manufacturing industries 1/	27,31,39	9,990	758	9,865	744	65	2	41	8	9	1	6	2	4	1
Nonmanufacturing		15,479	1,353	14,674	1,199	270	23	351	67	90	30	44	20	51	14
Transportation and utilities	40–42,44–49	274	77	167	11	4	1	53	36	20	12	13	8	18	9
Communications	48	38	14	22	9	2	0	3	0	1	0	0	0	10	5
Telephone communications	481	11	5	0	0	0	0	0	0	1	0	0	0	10	5
Other communications	482–484,489	27	9	22	9	2	0	3	0	0	0	0	0	0	0
Electric, gas, and sanitary services	49	122	58	43	1	2	1	45	35	18	11	11	6	3	3
Other transportation and utilities	40–42,44–47	114	5	102	0	0	0	4	1	1	1	2	2	5	1
Trade	50–59	2,950	376	2,695	359	119	2	91	6	31	7	5	2	9	1
Finance, insurance, and real estate	60–65,67	308	18	210	1	3	0	73	8	10	4	2	2	10	3
Services	701,72,73, 75–81,83, 84,87,89	4,896	515	4,601	468	124	15	111	15	23	6	24	9	13	1
Business services	73	2,750	323	2,564	294	90	12	63	10	19	5	8	0	7	1
Computer and data processing services	737	2,366	316	2,217	293	81	11	52	9	8	2	6	0	2	1
Other business services	731–736,738	384	6	347	1	8	1	11	1	11	3	2	0	5	0
Health services	80	351	12	337	5	4	0	6	4	1	1	3	2	0	0
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	317	9	307	4	3	0	4	3	0	0	3	2	0	0
Other health services	802–805, 808–809	34	3	30	1	1	0	2	1	1	1	0	0	0	0
Engineering and management services	87	1,413	168	1,342	164	27	3	33	0	1	0	5	1	5	0
Engineering, architectural, and surveying	871	593	29	557	26	11	2	21	0	1	0	3	1	0	0
Research, development, and testing	873	661	140	639	139	12	1	4	0	0	0	1	0	5	0
Other engineering and management services	872,874	159	0	145	0	4	0	8	0	0	0	1	0	0	0

See explanatory information and SOURCE at end of table.

[illegible]

Industry	SIC code	Total		Size of company											
				Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside
Other services	701,72,75–79, 81,83,84,89	382	12	359	5	3	0	9	1	2	0	8	6	1	0
Other nonmanufacturing industries 1/	07–12,14,15, 161–162,17	7,051	368	7,000	359	19	5	23	2	6	1	1	0	1	0

1/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for Other manufacturing industries and for Other nonmanufacturing industries for 1996 are not comparable with statistics for prior years.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

[illegible] R&D performed outside the United States by U.S. R&D-performing domestic companies and their foreign subsidiaries, by selected industry: 1986-96

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Industry	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
		[Dollars in millions]										
Total		$4,624	$5,226	$6,208	$6,706	$7,952	$9,147	$10,063	$9,565	$9,395	$13,052	$14,050
Food, kindred, and tobacco products	20,21	69	37	27	42	41	66	88	112	117	142	155
Chemicals and allied products	28	1,071	1,243	1,548	1,532	2,007	2,401	2,676	2,833	2,456	4,194	3,801
Industrial and other chemicals	281–82,284–89	579	625	855	609	720	1,009	1,045	1,318	917	1,632	1,720
Drugs and medicines	283	492	618	693	923	1,287	1,392	1,631	1,516	1,539	2,562	2,082
Petroleum refining and extraction	13,29	40	47	59	47	76	107	119	104	111	76	78
Stone, clay, and glass products	32	(D)	(D)	(D)	(D)	59	38	41	38	27	31	32
Primary metals	33	(D)	18	23	24	26	20	18	12	15	26	29
Fabricated metal products	34	26	40	(D)	(D)	95	86	109	119	125	111	133
Machinery	35	951	1,233	1,326	1,432	1,451	1,476	[illegible]	340	308	501	1,404
Electrical equipment	36	(S)	432	591	573	770	651	568	525	495	872	959
Radio and TV receiving equipment	365	(D)	0	(D)	(D)	(D)	2	(D)	(D)	3	(D)	(D)
Communication equipment	366	(D)	188	290	199	174	151	(D)	(D)	110	(D)	(D)
Electronic components	367	150	204	246	160	185	164	168	322	276	437	470
Other electrical equipment	361–64,369	25	39	(D)	(D)	(D)	334	217	113	107	291	260
Transportation equipment	37	(D)	(D)	1,750	1,916	2,055	2,402	(D)	(D)	(D)	(D)	(D)
Motor vehicles and other transportation equipment	371,373–75,379	(D)	(D)	1,477	1,501	1,901	2,166	(D)	(D)	(D)	(D)	(D)
Aircraft and missiles	372,376	182	237	273	415	154	236	493	(D)	251	284	(D)
Professional and scientific instruments	38	212	317	404	474	611	656	685	751	900	988	960
Other manufacturing industries 1/	22–27,30–31,39	141	138	178	269	344	467	524	(D)	572	(D)	(D)
Nonmanufacturing industries 1/ 2/	07–10,12–17,40–42, 44–49,50–59,60–65, 67,701,73,75–76,78–79, 80–81,83–84,87,89	27	64	146	256	415	778	835	1,770	1,500	2,206	2,510

1/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not comparable with statistics for prior years.

2/ Nonmanufacturing industries for 1990 and prior years included the following SICs only: 10–11, 14–17, 40–42, 44–51, 53–54, 56, 60, 62–63, 72–73, 78, 806–07, and 87.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

NOTES: Data are reported in current U.S. dollars.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

Table A-12a. Federal funds for industrial R&D performance, by industry and size of company: 1986–96

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Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
		[Dollars in millions]										
All Industries		$27,891	$30,752	$30,343	$28,554	$28,125	$26,372	$24,722	$22,809	$22,463	$23,451	$23,653
Distribution by industry:												
Manufacturing		25,185	28,052	27,088	24,826	23,683	20,867	19,152	16,669	17,373	18,831	20,020
Food, kindred, and tobacco products	20,21	(D)	2	(D)	(D)	(D)	0	0	0	0	0	0
Textiles and apparel	22,23	(D)	(D)	(D)	(D)	(D)	(S)	(D)	(D)	(D)	(D)	(D)
Lumber, wood products, and furniture	24,25	0	0	(D)	0	0	(D)	(D)	(D)	(D)	(D)	(D)
Paper and allied products	26	(D)	(D)	(D)	0	0	(D)	(D)	(D)	(D)	(D)	(D)
Chemicals and allied products	28	179	190	238	126	123	209	(S)	(D)	(D)	210 (S)	(D)
Industrial chemicals	281–82,286	178	185	232	111	109	165	(S)	(D)	(D)	(D)	(D)
Drugs and medicines	283	1	(D)	6	(D)	(D)	(D)	(S)	15	8	14	3
Other chemicals	284–85,287–89	0	(D)	0	(D)	(D)	(D)	(S)	(D)	(D)	(D)	0
Petroleum refining and extraction	13,29	(D)	14	22	(S)	(S)	11	9	14	10	6	24
Rubber products	30	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Stone, clay, and glass products	32	9	10	(D)	(D)	(D)	(D)	(D)	9	38	6	5
Primary metals	33	(D)	19	17	22	(D)	8	(S)	23	17	13	(D)
Ferrous metals and products	331–32,3398–99	(D)	(D)	1	(D)	(D)	1	(D)	17	(D)	(D)	(D)
Nonferrous metals and products	333–36	8	(D)	16	(D)	(D)	7	(D)	6	(D)	(D)	(D)
Fabricated metal products	34	95	150	163	178	203	226	294	222	243	86	(D)
Machinery	35	(D)	(D)	(D)	(D)	871	1,055	1,035	86	99	(D)	117
Office, computing, and accounting machines	357	(D)	(D)	(D)	(D)	(D)	(D)	(D)	33	28	(D)	(D)
Other machinery, except electrical	351–56,358–59	75	44	101	112	(D)	(D)	(D)	53	71	64	(D)
Electrical equipment	36	5,213	5,399	4,153	3,743	4,133	4,550	3,844	1,667	1,801	1,690	2,143
Radio and TV receiving equipment	365	0	0	0	0	0	0	(D)	(D)	(D)	(D)	(D)
Communication equipment	366	4,552	4,729	3,630	2,911	2,344	(D)	(D)	(D)	(D)	(D)	(D)
Electronic components	367	(D)	656	449	369	418	(D)	247	206	162	(D)	(D)
Other electrical equipment	361–64,369	(D)	14	74	463	1,371	(D)	(D)	(D)	(D)	(D)	(D)
Transportation equipment	37	17,708	20,784	20,865	19,262	17,097	12,570	11,202	10,617	10,392	13,130	12,202
Motor vehicles and motor vehicles equipment	371	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Other transportation equipment	373–75,379	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Aircraft and missiles	372,376	14,984	18,519	18,402	16,828	15,248	11,096	(S)	9,372	8,794	11,462	10,515

See explanatory information and SOURCE at end of table.

Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
		[Dollars in millions]										
Distribution by industry:												
Professional and scientific instruments	38	$351	$272	$191	$263	$737	$1,865	$2,221	$2,577	$3,384	$3,460 (S)	$3,942
Scientific and mechanical measuring instruments	381–82	(D)	(D)	(S)	(S)	(S)	(D)	2,143	2,484	3,266	3,358 (S)	(D)
Optical, surgical, photographic, and other instruments	384–87	(D)	(D)	95	101	87	(D)	78	92	118	102	(D)
Other manufacturing industries 1/	27,31,39	2	(D)	(D)	(D)	(D)	(D)	61	(D)	(D)	(D)	(D)
Nonmanufacturing 2/		2,706	2,700	3,256	3,729	4,442	5,505	5,570	6,140	5,090	4,620	3,633
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA	252	135
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	93	42
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Trade	50–59	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	51 (S)
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Services	701,72,73,75–81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	4,270	3,118
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	612	361
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA	514	(D)
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA	98	(D)
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA	4	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	3
Other health services	802–805,808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	3,650	2,746
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,883	994
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	1,708 (S)
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	45

See explanatory information and SOURCE at end of table.

Table A-25. Federal funds for industrial R&D performance, by industry and size of company, 1986–96

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Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
		[Dollars in millions]										
Distribution by industry:												
Other services	701,72,75–79, 81,83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	$4	(D)
Other nonmanufacturing industries 1/	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA	11	(D)
Distribution by size of company: [Number of employees]												
Total		$27,891	$30,752	$30,343	$28,554	$28,125	$26,372	$24,722	$22,809	$22,463	$23,451	$23,653
Fewer than 500		868	963	816	901	895	1,887	2,025	1,614	1,164	1,978	2,301
500 to 999		137	115	131	117	(S)	181	151	182	182	225	219
1,000 to 4,999		1,229	981	1,093	958	881	1,050	(S)	1,115	1,083	798	512
5,000 to 9,999		796	748	864	740	257	816	763	764	825	243	468
10,000 to 24,999		2,004	2,362	1,705	1,129	1,526	3,373	3,416	2,816	2,348	1,946 (S)	1,031 (S)
25,000 or more		23,213	25,583	25,734	24,709	24,436	19,065	17,346	16,319	16,862	18,261	19,122

1/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not comparable with statistics for prior years.

2/ Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.
NA = Not available.

NOTE: As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

Table A-11a. Number of R&D-performing companies reporting Federal R&D funds and total number of R&D-performing companies, by industry and size of company: 1996

Page 1 of 3

Industry	SIC code	Total		Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal
		Size of company													
All industries		34,569	2,574	31,519	2,345	1,132	39	1,324	64	292	58	175	25	127	44
Manufacturing		19,090	1,380	16,846	1,205	862	26	973	43	202	53	131	19	76	34
Food, kindred, and tobacco products	20,21	645	0	449	0	63	0	94	0	16	0	11	0	12	0
Textiles and apparel	22,23	451	2	317	1	65	0	51	0	9	1	8	0	1	0
Lumber, wood products, and furniture	24,25	429	2	356	1	23	0	33	0	11	0	4	0	2	1
Paper and allied products	26	197	2	107	0	11	0	57	1	6	0	10	0	6	1
Chemicals and allied products	28	618	19	430	2	52	0	89	5	22	6	17	4	8	2
Industrial chemicals	281–82,286	169	14	94	0	25	0	31	3	8	5	8	4	3	2
Drugs and medicines	283	100	5	58	2	6	0	22	2	5	1	6	0	3	0
Other chemicals	284–85,287–89	349	0	278	0	21	0	37	0	9	0	3	0	2	0
Petroleum refining and extraction	13,29	124	54	104	50	1	0	5	0	1	1	9	2	4	1
Rubber products	30	558	4	389	0	83	0	73	2	7	2	4	0	2	0
Stone, clay, and glass products	32	248	5	200	1	15	1	24	2	5	1	4	0	0	0
Primary metals	33	231	10	163	2	16	1	31	2	13	1	5	3	3	1
Ferrous metals and products	331–32,3398–99	137	3	102	0	3	0	21	1	9	1	2	1	1	0
Nonferrous metals and products	333–36	94	7	61	2	13	1	10	1	4	0	3	2	2	1
Fabricated metal products	34	1,005	9	823	2	91	1	68	2	10	2	11	2	1	0
Machinery	35	1,875	22	1,534	8	109	1	185	3	26	4	18	4	3	2
Office, computing, and accounting machines	357	151	5	114	1	12	1	12	0	7	2	5	0	1	1
Other machinery, except electrical	351–56,358–59	1,724	17	1,420	7	97	0	173	3	19	2	13	4	2	1
Electrical equipment	36	1,497	69	1,178	30	155	14	126	16	18	2	12	2	9	6
Radio and TV receiving equipment	365	51	1	42	0	5	0	3	1	1	0	0	0	0	0
Communication equipment	366	290	10	232	5	27	1	23	1	4	1	1	0	2	2
Electronic components	367	588	46	466	18	61	12	46	13	7	0	4	2	4	2
Other electrical equipment	361–64,369	569	12	437	7	62	1	54	1	6	1	7	0	3	2
Transportation equipment	37	346	52	204	2	52	1	25	2	40	31	10	1	16	15
Motor vehicles and motor vehicles equipment	371	179	5	100	0	51	0	9	1	8	1	7	0	4	3
Other transportation equipment	373–75,379	94	30	52	0	0	0	10	0	28	27	2	0	3	3
Aircraft and missiles	372,376	73	17	52	2	1	1	6	1	4	3	1	1	9	9

See explanatory information and SOURCE at end of table.

[illegible] R&D funding and total number of R&D-performing companies, by industry and size of company: 1996

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Industry	SIC code	Total		Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal
		Size of company													
Professional and scientific instruments	38	877	89	727	67	61	7	72	8	10	2	2	1	5	4
Scientific and mechanical measuring instruments	381–82	468	59	395	45	39	5	27	4	3	1	1	1	3	3
Optical, surgical, photographic, and other instruments	384–87	409	30	332	22	22	2	45	4	7	1	1	0	2	1
Other manufacturing industries 1/	27,31,39	9,990	1,040	9,865	1,039	65	0	41	0	9	0	6	0	4	1
Nonmanufacturing		15,479	1,194	14,674	1,140	270	13	351	20	90	5	44	6	51	10
Transportation and utilities	40–42,44–49	274	10	167	0	4	0	53	2	20	2	13	1	18	5
Communications	48	38	4	22	0	2	0	3	0	1	0	0	0	10	4
Telephone communications	481	11	4	0	0	0	0	0	0	1	0	0	0	10	4
Other communications	482–484,489	27	0	22	0	2	0	3	0	0	0	0	0	0	0
Electric, gas, and sanitary services	49	122	5	43	0	2	0	45	1	18	2	11	1	3	1
Other transportation and utilities	40–42,44–47	114	1	102	0	0	0	4	1	1	0	2	0	5	0
Trade	50–59	2,950	55	2,695	50	119	3	91	0	31	0	5	1	9	1
Finance, insurance, and real estate	60–65,67	308	1	210	1	3	0	73	0	10	0	2	0	10	0
Services	701,72,73, 75–81,83, 84,87,89	4,896	612	4,601	576	124	10	111	18	23	1	24	4	13	3
Business services	73	2,750	133	2,564	124	90	3	63	5	19	0	8	0	7	1
Computer and data processing services	737	2,366	130	2,217	122	81	2	52	5	8	0	6	0	2	1
Other business services	731–736,738	384	3	347	2	8	1	11	0	11	0	2	0	5	0
Health services	80	351	7	337	3	4	2	6	0	1	0	3	2	0	0
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	317	6	307	2	3	2	4	0	0	0	3	2	0	0
Other health services	802–805, 808–809	34	1	30	1	1	0	2	0	1	0	0	0	0	0

See explanatory information and SOURCE at end of table.

Table A-13a. Number of R&D-performing companies reporting Federal R&D funds and total number of R&D-performing companies, by industry and size of company: 1996

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Industry	SIC code	Total		Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal
		Size of company													
Engineering and management services	87	1,413	469	1,342	447	27	5	33	13	1	1	5	2	5	1
Engineering, architectural, and surveying	871	593	213	557	201	11	2	21	7	1	1	3	2	0	0
Research, development, and testing	873	661	230	639	225	12	3	4	1	0	0	1	0	5	1
Other engineering and management services	872,874	159	26	145	21	4	0	8	5	0	0	1	0	0	0
Other services	701,72,75–79, 81,83,84,89	382	3	359	2	3	0	9	0	2	0	8	0	1	1
Other nonmanufacturing industries 1/	07–12,14,15, 161–162,17	7,051	516	7,000	513	19	0	23	0	6	2	1	0	1	1

1/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not comparable with statistics for prior years.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

Table A-14a. Industry-administered federally-funded R&D centers (FFRDC's)—funds by character of work, full-time-equivalent (FTE) R&D scientists and engineers, and total number of employees: 1986–96

Page 1 of 1

Item	1986	1987	1988	1989	1990	1991	1992	1993 3/	1994	1995	1996
	[Dollars in millions]										
Total R&D funds	$1,891	$1,995	$2,122	$2,195	$2,323	$2,277	$2,353	$1,965	$2,202	$2,273	$2,297
Basic research	117	142	337	398	499	461	474	492	503	530	708
Applied research	629	623	371	374	386	433	507	435	503	535	231
Development	1,145	1,230	1,414	1,423	1,438	1,383	1,373	1,039	1,196	1,209	1,358
	[Employment]										
Number of FTE R&D scientists and engineers 1/	7,432	8,432	10,994	11,618	12,438	11,977	11,770	8,083	8,362	9,033	8,696
Total employment 2/	24,156	33,804	36,143	35,716	42,153	39,697	40,755	23,930	23,905	24,031	21,735

1/ These data were recorded in January of the year following that listed.

2/ These data were recorded in March of the year listed.

3/ The number of industry-administered FFRDCs remained the same in 1993 compared with 1992, however the levels of R&D performed and employment decreased because of changes in contract requirements and funding.

NOTE: Industry-administered FFRDC's conduct R&D almost exclusively for use by the Federal Government. Data for these FFRDC's administered by industry are included in Federal R&D support shown in other tables under the industry classifications of the administering firms. See section C for a listing of industry-administered FFRDC's and their locations.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

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Table A-15a. Concentration of total, Federal, and company and other R&D funds and net sales of R&D-performing companies, by size of R&D program: 1986–96

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Companies ranked by size of R&D program	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
	Percent of total (company, Federal, and other) R&D funds										
First 4 (1–4)	19%	19%	18%	19%	18%	16%	15%	17%	15%	16%	15%
Next 4 (5–8)	11	12	12	13	13	8	8	7	8	8	8
Next 12 (9–20)	14	16	17	16	15	12	13	13	14	13	13
Next 20 (21–40)	13	12	12	12	12	11	11	12	13	12	12
Next 60 (41–100)	15	14	15	15	16	15	15	16	15	14	14
Next 100 (101–200)	10	8	8	8	9	12	12	8	9	8	9
Next 200 (201–400)	8	6	7	6	7	6	6	7	7	7	7
	Percent of Federal R&D funds										
First 4 (1–4)	30	31	31	36	38	14	11	23	26	35	37
Next 4 (5–8)	16	18	18	15	16	21	18	17	19	19	20
Next 12 (9–20)	28	27	27	30	26	21	27	32	32	27	23
Next 20 (21–40)	15	15	15	11	12	15	13	16	13	8	7
Next 60 (41–100)	7	7	6	6	6	13	11	5	7	5	5
Next 100 (101–200)	2	1	3	1	1	3	4	5	2	3	4
Next 200 (201–400)	1	0	0	0	0	2	2	2	1	3	4
	Percent of company and other (except Federal) R&D funds										
First 4 (1–4)	20	20	21	22	21	17	17	17	16	16	15
Next 4 (5–8)	7	7	7	7	7	7	8	7	7	7	7
Next 12 (9–20)	12	12	12	13	12	10	12	12	12	11	11
Next 20 (21–40)	10	11	12	12	13	10	11	11	11	11	10
Next 60 (41–100)	16	16	16	16	17	16	17	14	14	14	14
Next 100 (101–200)	10	10	10	10	10	15	14	9	9	9	10
Next 200 (201–400)	8	8	8	8	8	7	7	8	8	8	8
	Percent of net sales ranked by size of total R&D funds										
First 4 (1–4)	8	7	7	6	8	7	8	8	8	8	6
Next 4 (5–8)	5	5	5	5	4	3	3	3	2	2	3
Next 12 (9–20)	5	5	5	5	5	4	4	4	5	6	6
Next 20 (21–40)	7	7	6	5	5	4	4	4	5	4	4
Next 60 (41–100)	10	11	11	12	12	12	12	11	10	9	8
Next 100 (101–200)	10	8	9	8	9	9	9	8	8	8	11
Next 200 (201–400)	9	12	10	11	12	11	11	10	10	10	11

NOTES: Companies were ranked individually for each year; therefore, particular companies comprising the size groups may have changed from year to year.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

Table A-16a. Domestic net sales of R&D-performing companies, by industry and size of company: 1995–96

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Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[Dollars in millions]						
		1995						
All Industries		$3,921,561	$374,478	$147,062	$615,336	$466,186	$749,478	$1,569,021
Manufacturing		2,756,605	235,280	103,696	475,358	309,009	578,348	1,054,914
Food, kindred, and tobacco products	20,21	313,839	9,809	7,917	54,931	33,436	60,183	147,563
Textiles and apparel	22,23	42,477	(D)	3,904	10,816	4,714	13,677	(D)
Lumber, wood products, and furniture	24,25	31,969	(D)	3,082	11,090	6,433	(D)	(D)
Paper and allied products	26	138,086	2,128	2,552	21,231	10,398	38,581	63,196
Chemicals and allied products	28	371,302	24,525	14,381	64,432	88,643	95,305	84,015
Industrial chemicals	281–82,286	133,416	9,180	9,192	25,760	9,930	46,587	32,767
Drugs and medicines	283	97,970	3,097	1,416	17,005	4,443	(D)	(D)
Other chemicals	284–85,287–89	139,915	12,248	3,773	21,667	74,270	(D)	(D)
Petroleum refining and extraction	13,29	245,662	1,053	(D)	20,614	(D)	136,022	78,656
Rubber products	30	76,816	22,555	(D)	19,650	7,385	7,583	(D)
Stone, clay, and glass products	32	30,363	2,953	2,883	8,098	3,795	12,634	0
Primary metals	33	115,664	4,145	4,714	29,665	25,053	19,425	32,662
Ferrous metals and products	331–32,3398–99	66,175	1,102	939	14,073	(D)	(D)	(D)
Nonferrous metals and products	333–36	49,489	3,042	3,775	15,592	(D)	(D)	(D)
Fabricated metal products	34	89,012	17,182	7,178	20,867	10,304	33,480	0
Machinery	35	269,689	73,687	17,591	63,552	36,592	46,915	31,252
Office, computing, and accounting machines	357	57,983	4,885	3,557	18,649	13,138	(D)	(D)
Other machinery, except electrical	351–56,358–59	211,706	68,802	14,034	45,003	23,454	(D)	(D)
Electrical equipment	36	315,070	32,757	15,181	60,102	24,103	42,146	140,782
Radio and TV receiving equipment	365	6,921	1,051	782	5,088	0	0	0
Communication equipment	366	47,827	9,771	4,132	12,528	(D)	(D)	(D)
Electronic components	367	120,519	12,479	5,998	26,438	(D)	(D)	(D)
Other electrical equipment	361–64,369	139,803	9,456	4,269	16,048	7,452	16,967	85,611

See explanatory information and SOURCE at end of table.

Table A-16a. Domestic net sales of R&D performing companies, by industry and size of company: 1995–96

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Industry	SIC code	Total	Size of company: Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[Dollars in millions]						
		1995						
Transportation equipment	37	$532,826	$7,430	$2,889	$51,802	$29,267	$45,941	$395,497
Motor vehicles and motor vehicles equipment	371	376,945	6,336	2,143	42,788	23,508	(D)	(D)
Other transportation equipment	373–75,379	24,978	(D)	451 (S)	5,132	0	8,620	(D)
Aircraft and missiles	372,376	130,904	(D)	296	3,881	5,759	(D)	117,695
Professional and scientific instruments	38	116,696	20,099	10,402	24,918	9,897	(D)	(D)
Scientific and mechanical measuring instruments	381–82	57,720	12,513	4,030	9,395	3,020	(D)	(D)
Optical, surgical, photographic, and other instruments	384–87	58,976	7,586	6,373	15,522	6,877	(D)	(D)
Other manufacturing industries	27,31,39	67,134	9,696	(D)	13,491	(D)	19,640	11,229
Nonmanufacturing		1,164,955	139,198	43,366	139,978	157,177	171,130	514,106
Transportation and utilities	40–42,44–49	460,565	(D)	(D)	43,898	50,520	75,016	288,497
Communications	48	220,446	433	(D)	7,021	(D)	0	211,201
Telephone communications	481	218,474	(D)	0	(D)	(D)	0	211,201
Other communications	482–484,489	1,972	(D)	(D)	(D)	0	0	0
Electric, gas, and sanitary services	49	168,314	(D)	0	32,841	48,195	(D)	(D)
Other transportation and utilities	40–42,44–47	71,805	(D)	0	4,036	(D)	(D)	(D)
Trade	50–59	315,337	43,687	5,136	47,538	59,928	24,586	134,462
Finance, insurance, and real estate	60–65,67	105,961	(D)	14,389	11,717	24,087	(D)	(D)
Services	701,72,73,75–81, 83,84,87,89	230,175	90,519	9,968	30,488	14,721	50,754	33,725
Business services	73	91,588	20,395	7,000	21,397	8,102	18,490	16,205
Computer and data processing services	737	76,697	18,576	6,412	19,216	(D)	(D)	9,443
Other business services	731–736,738	14,891	1,819	589	2,181	(D)	(D)	6,762
Health services	80	14,480	3,097	(D)	993	0	(D)	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	13,812	2,906	(D)	572	0	(D)	(D)
Other health services	802–805,808–809	668	191	0	421 (S)	0	(D)	0

See explanatory information and SOURCE at end of table.

Table A-16a. Domestic net sales of R&D-performing companies, by industry and size of company: 1995–96

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Industry	SIC code	Total	Size of company: Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[Dollars in millions]						
		1995						
Engineering and management services	87	$98,178	$64,091	(D)	$6,246	$4,113	$10,322	(D)
Engineering, architectural, and surveying	871	51,343	26,723	$1,379	5,004	(D)	(D)	(D)
Research, development, and testing	873	39,209	35,844	645	(D)	0	(D)	$0
Other engineering and management services	872,874	7,627	1,524	(D)	(D)	(D)	(D)	0
Other services	701,72,75–79,81, 83,84,89	25,929	2,936	442	1,852	2,506	(D)	(D)
Other nonmanufacturing industries	07–12,14,15,161–162,17	52,917	2,349	(D)	6,337	7,921	(D)	(D)
		1996						
All Industries		4,076,076	339,405	147,701	618,426	422,915	791,806	1,755,822
Manufacturing		2,765,725	201,551	109,851	419,199	286,671	600,657	1,147,797
Food, kindred, and tobacco products	20,21	350,424	17,940	15,549	55,728	39,762	50,258	171,186
Textiles and apparel	22,23	50,569	5,580	(D)	13,795	5,015	16,958	(D)
Lumber, wood products, and furniture	24,25	46,587	5,167	(D)	11,230	9,687	9,325	(D)
Paper and allied products	26	132,978	3,297	1,097	22,488	9,445	39,157	57,493
Chemicals and allied products	28	332,229	14,882	10,517	64,808	50,477	94,658	96,887
Industrial chemicals	281–82,286	142,755	4,902	7,083	27,502	15,716	49,707	37,845
Drugs and medicines	283	97,142	1,298	(D)	14,776	14,444	34,201	(D)
Other chemicals	284–85,287–89	92,333	8,682	(D)	22,530	20,317	10,749	(D)
Petroleum refining and extraction	13,29	248,815	4,025	(D)	10,086	(D)	142,384	90,492
Rubber products	30	70,598	11,699	9,496	23,791	(D)	5,869	(D)
Stone, clay, and glass products	32	37,429	3,830	1,766	9,761	6,374	15,698	0
Primary metals	33	103,908	6,473	(D)	18,436	21,358	(D)	34,436
Ferrous metals and products	331–32,3398–99	60,179	3,793	(D)	8,802	15,530	(D)	(D)
Nonferrous metals and products	333–36	43,729	2,680	(D)	9,635	5,828	12,386	(D)
Fabricated metal products	34	95,343	15,960	(D)	21,694	13,931	25,781	(D)
Machinery	35	259,426	31,320	(D)	55,447	37,834	70,245	(D)
Office, computing, and accounting machines	357	81,929	3,045	(D)	9,976	8,893	27,360	(D)
Other machinery, except electrical	351–56,358–59	177,497	28,275	(D)	45,471	28,941	42,884	(D)

See explanatory information and SOURCE at end of table.

Table A-16a. Domestic net sales of R&D-performing companies, by industry and size of company: 1995–96

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[Dollars in millions]						
		1996						
Electrical equipment	36	$334,058	$27,254	$17,217	$60,027	$33,196	$47,683	$148,680
Radio and TV receiving equipment	365	7,064	1,302	875	(D)	(D)	0	0
Communication equipment	366	51,140	6,075	3,510	(D)	(D)	(D)	(D)
Electronic components	367	146,303	9,842	6,691	26,665	16,164	16,723	70,218
Other electrical equipment	361–64,369	129,551	10,034	6,142	17,117	6,049	(D)	(D)
Transportation equipment	37	500,269	3,357	3,636	13,572	30,538	45,175	403,992
Motor vehicles and motor vehicles equipment	371	348,614	(D)	(D)	5,876	24,879	40,050	273,012
Other transportation equipment	373–75,379	25,444	(D)	0	4,619	(D)	(D)	15,984
Aircraft and missiles	372,376	126,211	1,643 (S)	(D)	3,078	(D)	(D)	114,997
Professional and scientific instruments	38	105,999	13,450	6,662	25,613	10,784	(D)	(D)
Scientific and mechanical measuring instruments	381–82	48,652	7,103	4,668	9,732	3,365	(D)	(D)
Optical, surgical, photographic, and other instruments	384–87	57,346	6,348	1,994	15,882	7,419	(D)	(D)
Other manufacturing industries 1/	27,31,39	97,093	37,318	6,174	12,721	9,826	11,700	19,354
Nonmanufacturing		1,310,352	137,855	37,851	199,227	136,244	191,149	608,026
Transportation and utilities	40–42,44–49	456,861	6,367	1,050	52,647	53,346	67,492	275,960
Communications	48	211,857	3,419	(D)	(D)	(D)	0	(D)
Telephone communications	481	206,298	0	0	0	(D)	0	(D)
Other communications	482–484,489	5,559	3,419	(D)	(D)	0	0	0
Electric, gas, and sanitary services	49	182,121	802	(D)	46,126	50,330	(D)	(D)
Other transportation and utilities	40–42,44–47	62,884	2,146	0	(D)	(D)	(D)	49,177
Trade	50–59	274,435	40,249	21,139	31,143	38,012	32,368	111,523
Finance, insurance, and real estate	60–65,67	296,786	3,271	905	72,094	20,624	(D)	(D)
Services	701,72,73,75–81, 83,84,87,89	235,129	68,045	12,544	36,407	13,258	79,343	25,533
Business services	73	103,818	24,615	8,619	20,320	10,065	21,916	18,283
Computer and data processing services	737	81,079	22,761	8,072	17,617	6,508	(D)	(D)
Other business services	731–736,738	22,739	1,853	546	2,702	3,558	(D)	(D)

See explanatory information and SOURCE at end of table.

Table A-16a. Domestic net sales of R&D-performing companies, by industry and size of company: 1995–96

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Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[Dollars in millions]						
		1996						
Health services	80	$12,403	$1,564	(D)	$1,097	(D)	$8,616	$0
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	11,740	1,473	(D)	(D)	$0	8,616	0
Other health services	802–805,808–809	663	91	(D)	(D)	(D)	0	0
Engineering and management services	87	75,448	40,403	$2,523	12,664	(D)	15,390	(D)
Engineering, architectural, and surveying	871	26,724	5,464	782	6,883	(D)	(D)	0
Research, development, and testing	873	39,127	32,882	1,056	(D)	0	(D)	(D)
Other engineering and management services	872,874	9,598	2,057	685	(D)	0	(D)	0
Other services	701,72,75–79,81,83,84,89	43,460	1,463	(D)	2,326	(D)	33,420	(D)
Other nonmanufacturing industries 1/	07–12,14,15,161–162,17	47,141	19,922	2,213	6,937	11,004	(D)	(D)

1/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

Table A-[illegible]a. Total (company, Federal, and other) R&D funds as a percent of net sales in R&D-performing companies, by industry and size of company: 1986–96

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Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
All Industries 1/		NA	NA	NA	NA	NA	NA	NA	NA	NA	3.4%	3.5%
Distribution by industry:												
Manufacturing		4.7%	4.6%	4.5%	4.3%	4.2%	4.2%	4.2%	3.8%	3.6%	3.6	4.0
Food, kindred, and tobacco products	20,21	(D)	0.6	(D)	(D)	(D)	0.5	0.5	0.5	0.5	0.5	0.4
Textiles and apparel	22,23	(D)	(D)	(D)	(D)	(D)	(D)	0.6	(D)	(D)	(D)	(D)
Lumber, wood products, and furniture	24,25	0.6	0.6	(D)	0.6	0.6	(D)	(D)	(D)	(D)	(D)	(D)
Paper and allied products	26	(D)	(D)	(D)	0.8	1.0	1.1	(D)	(D)	(D)	(D)	(D)
Chemicals and allied products	28	5.2	5.3	5.3	5.4	5.3	5.4	5.5	(D)	(D)	4.7	(D)
Industrial chemicals	281–82,286	4.6	4.7	4.4	4.2	4.5	4.6	4.6	(D)	(D)	(D)	(D)
Drugs and medicines	283	8.5	(D)	8.8	(D)	(D)	8.9	9.6	12.5	10.2	10.4	10.1
Other chemicals	284–85,287–89	3.3	(D)	3.4	(D)	(D)	3.1	2.7	(D)	(D)	(D)	2.7
Petroleum refining and extraction	13,29	(D)	1.0	1.0	0.9	0.9	1.0	0.9	0.9	0.8	0.7	0.7
Rubber products	30	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Stone, clay, and glass products	32	2.5	2.6	(D)	(D)	(D)	(D)	(D)	1.5	1.7	1.5	1.3
Primary metals	33	(D)	0.9	0.8	0.8	0.8	0.8	0.6	0.7	0.6	0.5	(D)
Ferrous metals and products	331–32,3398–99	(D)	(D)	0.5	(D)	(D)	(D)	(D)	0.5	(D)	(D)	(D)
Nonferrous metals and products	333–36	1.5	(D)	1.0	(D)	(D)	(D)	(D)	1.2	(D)	(D)	(D)
Fabricated metal products	34	1.5	1.5	1.3	1.5	1.4	1.5	1.5	1.4	1.2	1.1	(D)
Machinery	35	(D)	(D)	7.7	7.9	7.7	8.1	7.8	4.6	3.8	(D)	5.2
Office, computing, and accounting machines	357	(D)	(D)	(D)	(D)	(D)	(D)	(D)	9.9	7.9	(D)	(D)
Other machinery, except electrical	351–56,358–59	3.0	3.0	2.9	(D)	(D)	(D)	(D)	2.6	2.5	2.4	(D)
Electrical equipment	36	7.9	8.2	7.5	7.3	6.5	6.5	5.6	6.2	5.9	6.0	6.7
Radio and TV receiving equipment	365	3.6	3.2	2.4	1.8	1.6	(D)	(D)	(D)	(D)	(D)	(D)
Communication equipment	366	9.9	10.2	10.7	11.6	10.0	(D)	(D)	(D)	(D)	(D)	(D)
Electronic components	367	(D)	10.0	9.0	(D)	8.3	7.9	7.5	8.1	7.5	(D)	(D)
Other electrical equipment	361–64,369	(D)	2.7	2.5	(D)	3.7	(D)	(D)	(D)	(D)	(D)	(D)
Transportation equipment	37	8.3	8.7	8.9	8.1	7.5	7.3	7.1	6.4	5.9	6.1	6.5
Motor vehicles and motor vehicles equipment	371	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Other transportation equipment	373–75,379	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Aircraft and missiles	372,376	13.4	14.7	16.3	13.5	11.8	12.1	11.8	12.5	13.8	12.9	12.9

See explanatory information and SOURCE at end of table.

Table A-[illegible]a. Total (company, Federal, and other) R&D funds as a percent of net sales in R&D-performing companies, by industry and size of company: 1986–96

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Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Distribution by industry:												
Professional and scientific instruments	38	8.8%	7.9%	7.4%	7.2%	8.0%	9.1%	9.4%	9.7%	9.2%	10.3%	11.5%
Scientific and mechanical measuring instruments	381–82	(D)	(D)	7.9	7.4	8.6	10.0	10.6	11.5	11.0	12.4	(D)
Optical, surgical, photographic, and other instruments	384–87	(D)	(D)	7.3	7.3	7.7	8.1	8.3	8.1	7.3	8.2	(D)
Other manufacturing industries 2/	27,31,39	1.2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Nonmanufacturing 1/		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.7	2.5
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2	1.0
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.0	1.3
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.3	0.2
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Trade	50–59	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	2.3
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Services	701,72,73,75–81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.8	8.1
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	10.1	10.2
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA	11.8	(D)
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.6	(D)
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.2	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	6.1 (S)
Other health services	802–805,808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.8	9.7
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.7	6.2
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	14.0
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	1.8

See explanatory information and SOURCE at end of table.

Table A-[illegible]: Total (company, Federal, and other) R&D funds as a percent of net sales in R&D-performing companies, by industry and size of company: 1986–96

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Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Distribution by industry:												
Other services	701,72,75–79,81, 83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.6%	(D)
Other nonmanufacturing industries 2/	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.8	(D)
Distribution by size of company: [Number of employees]												
Total 1/		NA	NA	NA	NA	NA	NA	NA	NA	NA	3.4	3.5%
Fewer than 500		NA	NA	NA	NA	NA	NA	NA	NA	NA	4.4	6.0
500 to 999		NA	NA	NA	NA	NA	NA	NA	NA	NA	3.2	3.1
1,000 to 4,999		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.8	3.0
5,000 to 9,999		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.0	2.7
10,000 to 24,999		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.3	2.5
25,000 or more		NA	NA	NA	NA	NA	NA	NA	NA	NA	4.3	4.0

1/ Beginning in 1995 this table included both manufacturing and nonmanufacturing companies. Only manufacturing companies were included in prior years.

2/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not comparable with statistics for prior years.

KEY:

(D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.
NA = Not available.

NOTE: As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

[illegible] except Federal R&D funds as a percent of net sales in R&D performing companies [illegible] by industry, and size of company: 1986–96

Page 1 of 3

Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
All industries 1/		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.8%	3.0%
Distribution by industry:												
Manufacturing		3.2%	3.1%	3.1%	3.1%	3.1%	3.2%	3.3%	3.1%	2.9%	2.9	3.3
Food, kindred, and tobacco products	20,21	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4
Textiles and apparel	22,23	0.5	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.9	0.8
Lumber, wood products, and furniture	24,25	0.6	0.6	0.6	0.6	0.6	0.9	0.9	0.7	0.6	0.7	1.4
Paper and allied products	26	0.7	0.6	0.8	0.8	1.0	1.1	1.0	1.1	1.0	1.0	1.2
Chemicals and allied products	28	5.1	5.2	5.2	5.4	5.3	5.3	5.4	6.0	5.1	4.7	5.3
Industrial chemicals	281–82,286	4.4	4.4	4.2	4.1	4.4	4.4	4.4	4.4	3.3	3.9	3.7
Drugs and medicines	283	8.4	8.7	8.8	8.9	8.8	8.9	9.6	12.5	10.2	10.4	10.1
Other chemicals	284–85,287–89	3.3	3.3	3.4	3.9	3.4	3.0	2.7	2.7	2.5	1.4	2.7
Petroleum refining and extraction	13,29	1.1	1.0	1.0	0.9	0.9	1.0	0.9	0.9	0.8	0.7	0.7
Rubber products	30	1.7	1.6	1.7	1.9	2.1	2.3	2.3	2.1	2.3	1.6	1.8
Stone, clay, and glass products	32	2.4	2.5	2.0	1.8	1.7	1.6	1.6	1.5	1.5	1.5	1.2
Primary metals	33	1.0	0.9	0.7	0.7	0.8	0.8	0.6	0.7	0.6	0.5	0.6
Ferrous metals and products	331–32,3398–99	0.7	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.4
Nonferrous metals and products	333–36	1.5	1.3	1.0	1.0	1.2	1.2	0.7	1.2	0.9	0.7	1.0
Fabricated metal products	34	1.4	1.2	1.1	1.2	1.1	1.2	1.1	1.1	1.0	1.1	1.4
Machinery	35	7.3	7.1	6.8	7.3	7.2	7.5	7.3	4.5	3.8	3.6	5.1
Office, computing, and accounting machines	357	12.4	12.3	11.2	13.1	14.4	14.9	13.7	9.8	7.9	8.1	9.9
Other machinery, except electrical	351–56,358–59	2.9	3.0	2.8	2.6	2.3	2.9	2.9	2.5	2.5	2.4	2.9
Electrical equipment	36	5.1	5.4	5.3	5.2	4.5	4.3	4.0	5.4	5.2	5.4	6.1
Radio and TV receiving equipment	365	3.6	3.2	2.4	1.8	1.6	1.0	0.6	4.0	1.0	1.6	2.0
Communication equipment	366	5.2	5.5	6.1	6.8	6.1	(S)	7.0	10.1	10.3	8.0	8.5
Electronic components	367	9.2	8.5	8.0	7.7	7.4	7.2	7.0	7.8	7.3	8.0	8.5
Other electrical equipment	361–64,369	2.2	2.6	2.3	2.3	2.2	2.2	2.1	2.3	2.1	2.5	2.6
Transportation equipment	37	3.6	3.4	3.5	3.5	3.4	4.0	4.2	3.9	3.7	3.6	4.1
Motor vehicles and motor vehicles equipment	371	3.3	3.4	3.4	3.7	3.7	4.1	4.0	3.7	3.4	3.6	4.2
Other transportation equipment	373–75,379	2.7	2.5	2.6	2.5	2.1	2.1	2.1	1.9	1.2	0.9	1.2
Aircraft and missiles	372,376	4.0	3.6	3.9	3.3	3.1	4.0	4.7	4.7	5.3	4.2	4.5

See explanatory information and SOURCE at end of table.

[illegible] R&D funds as a percent of net sales in R&D-performing companies, by industry and size of company: 1986–96

Page 2 of 3

Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Distribution by industry:												
Professional and scientific instruments	38	8.2%	7.5%	7.1%	6.8%	7.1%	7.1%	7.2%	7.2%	6.5%	7.3%	7.7%
Scientific and mechanical measuring instruments	381–82	8.4	8.1	7.6	6.9	6.9	6.3	6.2	6.4	5.8	6.6	6.7
Optical, surgical, photographic, and other instruments	384–87	8.0	7.2	7.1	7.1	7.5	8.0	8.2	7.9	7.2	8.0	8.6
Other manufacturing industries 2/	27,31,39	1.2	1.1	1.0	0.9	0.9	0.8	1.3	1.3	1.1	1.2	2.5
Nonmanufacturing 1/		NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	0.0
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1	1.0
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.2	1.9
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.1	1.9
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.0	1.3
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.2	0.2
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.1	0.3
Trade	50–59	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.4	2.3
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.7	0.4
Services	701,72,73,75–81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.9	6.8
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.5	9.9
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA	11.1	12.4
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.9	1.1
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.2	5.9 (S)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.3	6.1 (S)
Other health services	802–805,808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.4 (S)	3.4
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.1	6.1
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.0	2.5
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.2	9.7
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.7	1.3

See explanatory information and SOURCE at end of table.

[illegible] R&D funds as a percent of net sales in R&D-performing companies,
by industry and size of company: 1986–96

Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Distribution by industry:												
Other services	701,72,75–79,81, 83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.6%	0.7%
Other nonmanufacturing industries 2/	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.8	2.5
Distribution by size of company: [Number of employees]												
Total 1/		NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	0.0
Fewer than 500		NA	NA	NA	NA	NA	NA	NA	NA	NA	3.9	5.3
500 to 999		NA	NA	NA	NA	NA	NA	NA	NA	NA	3.0	3.0
1,000 to 4,999		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.6	2.9
5,000 to 9,999		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.0	2.6
10,000 to 24,999		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.0	2.4
25,000 or more		NA	NA	NA	NA	NA	NA	NA	NA	NA	3.1	2.9

1/ Beginning in 1995 this table included both manufacturing and nonmanufacturing companies. Only manufacturing companies were included in prior years.

2/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not comparable with statistics for prior years.

KEY: (S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.
NA = Not available.

NOTE: As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

[illegible] Federal and other funds for performance of basic research, applied research, and development, in current and in constant dollars: 1953–96

Page 1 of 2

Year	Total		Basic research		Applied research		Development	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]							
1953 1/	$3,630	$17,988	$151	$748	$726	$3,598	$2,753	$13,642
1954 1/	4,070	19,941	166	813	814	3,988	3,090	15,140
1955 1/	4,640	22,372	189	911	928	4,474	3,523	16,986
1956	6,605	30,764	253	1,178	1,268	5,906	5,084	23,680
1957	7,731	34,856	271	1,222	1,670	7,529	5,790	26,105
1958	8,389	36,940	295	1,299	1,911	8,415	6,183	27,226
1959	9,618	41,908	320	1,394	1,991	8,675	7,307	31,839
1960	10,509	45,161	376	1,616	2,029	8,719	8,104	34,826
1961	10,908	46,338	395	1,678	1,977	8,398	8,536	36,262
1962	11,464	48,087	488	2,047	2,449	10,273	8,527	35,768
1963	12,630	52,363	522	2,164	2,457	10,187	9,651	40,012
1964	13,512	55,196	549	2,243	2,600	10,621	10,363	42,333
1965	14,185	56,831	592	2,372	2,658	10,649	10,935	43,810
1966	15,548	60,569	624	2,431	2,843	11,075	12,081	47,063
1967	16,385	61,854	629	2,374	2,915	11,004	12,841	48,475
1968	17,429	63,057	642	2,323	3,124	11,302	13,663	49,432
1969	18,308	63,262	618	2,135	3,287	11,358	14,403	49,768
1970	18,067	59,275	602	1,975	3,427	11,243	14,038	46,056
1971	18,320	57,143	590	1,840	3,415	10,652	14,315	44,651
1972	19,552	58,504	593	1,774	3,514	10,515	15,445	46,215
1973	21,249	60,195	631	1,788	3,825	10,836	16,793	47,572
1974	22,887	59,493	699	1,817	4,288	11,146	17,900	46,530
1975	24,187	57,465	730	1,734	4,570	10,858	18,887	44,873
1976	26,997	60,599	819	1,838	5,112	11,475	21,066	47,286
1977	29,825	62,882	911	1,921	5,636	11,883	23,278	49,079
1978 1/	33,304	65,443	1,035	2,034	6,300	12,380	25,969	51,030
1979	38,226	69,212	1,158	2,097	7,225	13,082	29,843	54,034
1980 1/	44,505	73,769	1,325	2,196	8,450	14,006	34,730	57,567
1981	51,810	78,488	1,614	2,445	10,699	16,208	39,497	59,835
1982 1/	58,650	83,583	1,904	2,713	12,323	17,562	44,423	63,308
1983	65,268	89,213	2,223	3,039	13,927	19,036	49,118	67,138
1984	74,800	98,525	2,608	3,435	15,765	20,765	56,427	74,324
1985	84,239	107,270	2,862	3,644	18,255	23,246	63,122	80,379
1986	87,823	108,989	4,047	5,022	19,759	24,521	64,017	79,445
1987	92,155	110,950	4,324	5,206	19,813	23,854	68,018	81,890
1988	97,015	112,690	4,500	5,227	20,748	24,100	71,767	83,363
1989	102,055	113,748	5,216	5,814	22,691	25,291	74,148	82,644

See explanatory information and SOURCE at end of table.

[illegible] for performance of basic research, applied research, and development, in current and in constant dollars: [illegible]

Page 2 of 2

Year	Total		Basic research		Applied research		Development	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]							
1990	$109,727	$117,230	$5,128	$5,479	$24,785	$26,480	$79,814	$85,271
1991	116,952	120,173	7,837	8,053	27,446	28,202	81,669	69,446
1992	119,110	119,110	7,002	7,002	26,168	26,168	85,940	85,940
1993	117,400	114,380	6,919	6,741	24,686	24,051	85,796	83,589
1994	119,595	113,802	7,017	6,677	23,490	22,352	89,088	84,773
1995	132,103	122,590	6,099	5,660	27,454	25,477	98,552	91,455
1996	144,667	131,265	8,207	7,447	29,241	26,532	107,218	97,285

1/ Character-of-work estimates were made by the National Science Foundation (NSF). See: NSF, *National Patterns of R&D Resources: 1996*, Final Report, NSF 96-333.

NOTES: The character-of-work estimation procedure was revised for 1986 and later years; hence, these data are not directly comparable with data for 1985 and earlier years. See technical notes for a more complete discussion of this change.

The 1992 gross domestic product (GDP) implicit price deflators were used to convert current dollars to constant dollars.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

[illegible] and other (except Federal) funds for performance of basic research, applied research, and development, in current and in constant dollars: 1953–96

Page 1 of 2

Year	Total		Basic research		Applied research		Development	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]							
1953 1/	$2,200	$10,902	$132	$654	$438	$2,170	$1,630	$8,077
1954 1/	2,320	11,367	143	701	492	2,411	1,685	8,256
1955 1/	2,460	11,861	162	781	560	2,700	1,738	8,380
1956	3,277	15,263	216	1,006	794	3,698	2,267	10,559
1957	3,396	15,311	230	1,037	992	4,472	2,174	9,802
1958	3,630	15,984	252	1,110	1,137	5,007	2,241	9,868
1959	3,983	17,355	248	1,081	1,178	5,133	2,557	11,142
1960	4,428	19,029	297	1,276	1,196	5,140	2,935	12,613
1961	4,668	19,830	314	1,334	1,165	4,949	3,189	13,547
1962	5,029	21,095	345	1,447	1,438	6,032	3,246	13,616
1963	5,360	22,222	375	1,555	1,450	6,012	3,535	14,656
1964	5,792	23,660	384	1,569	1,560	6,373	3,848	15,719
1965	6,445	25,821	406	1,627	1,620	6,490	4,419	17,704
1966	7,216	28,111	451	1,757	1,804	7,028	4,961	19,326
1967	8,020	30,276	427	1,612	1,849	6,980	5,744	21,684
1968	8,869	32,088	462	1,671	2,081	7,529	6,326	22,887
1969	9,857	34,060	458	1,583	2,272	7,851	7,127	24,627
1970	10,288	33,753	444	1,457	2,378	7,802	7,466	24,495
1971	10,654	33,231	456	1,422	2,441	7,614	7,757	24,195
1972	11,535	34,515	463	1,385	2,562	7,666	8,510	25,464
1973	13,104	37,122	499	1,414	2,832	8,023	9,773	27,686
1974	14,667	38,126	536	1,393	3,263	8,482	10,868	28,251
1975	15,582	37,021	573	1,361	3,440	8,173	11,569	27,486
1976	17,436	39,138	634	1,423	3,912	8,781	12,890	28,934
1977	19,340	40,776	701	1,478	4,311	9,089	14,328	30,209
1978 1/	22,115	43,456	785	1,543	4,870	9,570	16,460	32,344
1979	25,708	46,547	893	1,617	5,670	10,266	19,145	34,664
1980 1/	30,476	50,515	1,035	1,716	6,550	10,857	22,891	37,943
1981	35,428	53,671	1,313	1,989	8,359	12,663	25,756	39,018
1982 1/	40,105	57,154	1,523	2,170	9,363	13,343	29,219	41,640
1983	44,588	60,946	1,760	2,406	10,286	14,060	32,542	44,481
1984	51,404	67,708	2,132	2,808	11,541	15,202	37,731	49,698
1985	57,043	72,638	2,373	3,022	12,908	16,437	41,762	53,180
1986	59,932	74,376	3,496	4,339	15,082	18,717	41,354	51,320
1987	61,403	73,926	3,583	4,314	15,153	18,243	42,667	51,369
1988	66,672	77,445	3,507	4,074	16,531	19,202	46,634	54,169
1989	73,501	81,923	3,832	4,271	17,993	20,055	51,676	57,597

See explanatory information and SOURCE at end of table.

[illegible] funds, for performance of basic research, applied research, and development, in current and in constant dollars: 1953–96

Page 2 of 2

Year	Total		Basic research		Applied research		Development	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]							
1990	$81,602	$87,182	$3,760	$4,017	$18,432	$19,692	$59,410	$63,472
1991	90,580	93,074	6,125	6,294	21,425	22,015	63,030	69,446
1992	94,388	94,388	5,816	5,816	21,184	21,184	67,385	67,385
1993	94,591	92,158	5,961	5,808	19,956	19,443	68,678	66,912
1994	97,131	92,426	6,078	5,784	19,372	18,434	71,683	68,211
1995	108,652	100,828	5,379	4,992	23,755	22,044	79,516	73,790
1996	121,015	109,804	6,848	6,214	25,370	23,020	88,798	80,572

1/ Character-of-work estimates were made by the National Science Foundation (NSF). See: Nsf, *National Patterns of R&D Resources: 1996*, Final Report, NSF 96-333.

NOTES: The character-of-work estimation procedure was revised for 1986 and later years; hence, these data are not directly comparable with data for 1985 and earlier years. See technical notes for a more complete discussion of this change.

The 1992 gross domestic product (GDP) implicit price deflators were used to convert current dollars to constant dollars.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

[illegible] funds for performance of basic research, applied research, and development [illegible] in current and in constant dollars: 1953–96

Page 1 of 2

Year	Total		Basic research		Applied research		Development	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]							
1953 1/	$1,430	$7,086	$19	$94	$288	$1,427	$1,123	$5,565
1954 1/	1,750	8,574	23	113	322	1,578	1,405	6,884
1955 1/	2,180	10,511	27	130	368	1,774	1,785	8,607
1956	3,328	15,501	37	172	474	2,208	2,817	1,992
1957	4,335	19,545	41	185	678	3,057	3,616	16,303
1958	4,759	20,956	43	189	774	3,408	3,942	17,358
1959	5,635	24,553	72	314	813	3,542	4,750	20,697
1960	6,081	26,132	79	339	833	3,580	5,169	22,213
1961	6,240	26,508	81	344	812	3,449	5,347	22,715
1962	6,434	26,988	143	600	1,011	4,241	5,281	22,152
1963	7,270	30,141	147	609	1,007	4,175	6,116	25,357
1964	7,720	31,536	165	674	1,040	4,248	6,515	26,614
1965	7,740	31,010	186	745	1,038	4,159	6,516	26,106
1966	8,332	32,458	173	674	1,039	4,048	7,120	27,737
1967	8,365	31,578	202	763	1,066	4,024	7,097	26,791
1968	8,560	30,970	180	651	1,043	3,774	7,337	26,545
1969	8,451	29,202	160	553	1,015	3,507	7,276	25,142
1970	7,779	25,522	158	518	1,049	3,442	6,572	21,562
1971	7,666	23,911	134	418	974	3,038	6,558	20,455
1972	8,017	23,989	130	389	952	2,849	6,935	20,751
1973	8,145	23,074	132	374	993	2,813	7,020	19,887
1974	8,220	21,367	163	424	1,025	2,664	7,032	18,279
1975	8,605	20,444	157	373	1,130	2,685	7,318	17,387
1976	9,561	21,461	185	415	1,200	2,694	8,176	18,352
1977	10,485	22,106	210	443	1,325	2,794	8,950	18,870
1978 1/	11,189	21,987	250	491	1,430	2,810	9,509	18,685
1979	12,518	22,665	265	480	1,555	2,815	10,698	19,370
1980 1/	14,029	23,254	290	481	1,900	3,149	11,839	19,624
1981	16,382	24,817	301	456	2,340	3,545	13,741	20,817
1982 1/	18,545	26,429	381	543	2,960	4,218	15,204	21,667
1983	20,680	28,267	463	633	3,641	4,977	16,576	22,657
1984	23,396	30,817	476	627	4,224	5,564	18,696	24,626
1985	27,196	34,631	489	623	5,347	6,809	21,360	27,200
1986	27,891	34,613	551	684	4,678	5,805	22,662	28,124
1987	30,752	37,024	740	891	4,660	5,610	25,352	30,523
1988	30,343	35,246	993	1,153	4,217	4,898	25,133	29,194
1989	28,554	31,826	1,384	1,543	4,698	5,236	22,472	25,047

See explanatory information and SOURCE at end of table.

[illegible] for performance of basic research, applied research, and development [illegible] in current and in constant dollars: 1953–96

Page 2 of 2

Year	Total		Basic research		Applied research		Development	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]							
1990	$28,125	$30,048	$1,368	$1,462	$6,353	$6,787	$20,404	$21,799
1991	26,372	27,098	1,712	1,759	6,021	6,187	18,639	69,446
1992	24,722	24,722	1,186	1,186	4,983	4,983	18,555	18,555
1993	22,809	22,222	958	933	4,730	4,608	17,118	16,678
1994	22,463	21,375	939	894	4,119	3,919	17,405	16,562
1995	23,451	21,762	720	668	3,699	3,433	19,031	17,661
1996	23,653	21,462	1,358	1,232	3,871	3,512	18,423 (S)	16,716

1/ Character-of-work estimates were made by the National Science Foundation (NSF). See: NSF, *National Patterns of R&D Resources: 1996*, Final Report, NSF 96-333.

KEY: (S) = Indicates computations of more than 50 percent.

NOTES: The character-of-work estimation procedure was revised for 1986 and later years; hence, these data are not directly comparable with data for 1985 and earlier years. See technical notes for a more complete discussion of this change.

The 1992 gross domestic product (GDP) implicit price deflators were used to convert current dollars to constant dollars.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

Table A-22. Funds for performance of basic research, applied research, and development, by industry and source of funds: 1994

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Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
All Industries		$119,595	$22,463	$97,131	$7,017	$939	$6,078	$23,490	$4,119	$19,372	$89,088	$17,405	$71,683
Manufacturing		90,749	17,373	73,375	4,981	250	4,732	17,321	2,084	15,238	68,447	15,039	53,408
Food, kindred, and tobacco products	20,21	1,476	0	1,476	114	0	114	473	0	473	889	0	889
Textiles and apparel	22,23	(D)	(D)	316	(D)	(D)	42	(D)	(D)	47	(D)	(D)	228
Lumber, wood products, and furniture	24,25	(D)	(D)	201	(D)	(D)	27	(D)	(D)	43	(D)	(D)	131
Paper and allied products	26	(D)	(D)	1,263	(D)	(D)	211	(D)	(D)	619	433	0	433
Chemicals and allied products	28	(D)	(D)	16,559	2,608	9	2,599	(D)	(D)	5,386	9,186	610	8,575
Industrial chemicals	281–82,286	(D)	(D)	4,780	(D)	(D)	1,066	(D)	(D)	(D)	(D)	(D)	(D)
Drugs and medicines	283	9,633	8	9,625	(D)	1	(D)	3,333	5	3,328	(D)	2	(D)
Other chemicals	284–85,287–89	(D)	(D)	2,154	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Petroleum refining and extraction	13,29	1,950	10	1,939	(D)	0	(D)	694	5	688	(D)	5	(D)
Rubber products	30	(D)	(D)	1,432	33	0	33	(D)	(D)	215	1,184	0	1,184
Stone, clay, and glass products	32	591	38	553	50	0	50	212	37	175	329	1	328
Primary metals	33	690	17	672	(D)	(D)	102	(D)	(D)	206	(D)	(D)	364
Ferrous metals and products	331–32,3398–99	(D)	(D)	241	(D)	(D)	19	(D)	(D)	84	(D)	(D)	138
Nonferrous metals and products	333–36	(D)	(D)	431	83	0	83	(D)	(D)	122	(D)	(D)	226
Fabricated metal products	34	1,111	243	868	(D)	(D)	78	(D)	(D)	184	833	226	606
Machinery	35	8,110	99	8,011	261	7	254	1,464	35	1,429	6,385	56	6,328
Office, computing, and accounting machines	357	4,106	28	4,078	(D)	(D)	62	(D)	(D)	713	3,316	13	3,303
Other machinery, except electrical	351–56,358–59	4,004	71	3,933	(D)	(D)	192	(D)	(D)	716	3,068	43	3,025
Electrical equipment	36	15,338	1,801	13,537	(D)	(D)	388	(D)	(D)	2,597	12,203	1,653 (S)	10,550
Radio and TV receiving equipment	365	(D)	(D)	64	(D)	(D)	(D)	(D)	0	(D)	36	1	35
Communication equipment	366	(D)	(D)	4,939	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	4,111
Electronic components	367	6,032	162	5,870	(D)	(D)	121	(D)	(D)	1,370	4,529	150	4,379
Other electrical equipment	361–64,369	(D)	(D)	2,664	(D)	(D)	118	(D)	(D)	521	(D)	(D)	2,025

See explanatory information and SOURCE at end of table.

[illegible] basic research, applied research, and development, by industry and source of funds: 1994

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Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
Transportation equipment	37	$28,087	$10,392	$17,695	$244	$109	$136	$2,044	$784 (S)	$1,259	$25,799	$9,499	$16,300
Motor vehicles and motor vehicles equipment	371	(D)	(D)	11,950	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Other transportation equipment	373–75,379	(D)	(D)	279	31	0	31	(D)	(D)	(D)	(D)	(D)	(D)
Aircraft and missiles	372,376	14,260	8,794	5,466	(D)	(D)	(D)	(D)	(D)	(D)	12,787	7,978	4,809
Professional and scientific instruments	38	11,441	3,384	8,058	(D)	(D)	467	2,086	299	1,787	(D)	(D)	5,803
Scientific and mechanical measuring instruments	381–82	6,952	3,266	3,687	(D)	(D)	197	1,409	271	1,138	(D)	(D)	2,351
Optical, surgical, photographic, and other instruments	384–87	4,489	118	4,371	(D)	(D)	270	677	28	649	(D)	(D)	3,452
Other manufacturing industries	27,31,39	(D)	(D)	796	(D)	(D)	93	129	0	129	(D)	(D)	574
Nonmanufacturing		28,846	5,090	23,756	2,036	689	1,346	6,169	2,035	4,134	20,641	2,366 (S)	18,275
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trade	50–59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See explanatory information and SOURCE at end of table.

[illegible] Funds for performance of basic research, applied research, and development, by industry, and source of funds: 1994

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Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
Services	701,72,73,75–81,83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other health services	802–805, 808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other services	701,72,75–79, 81,83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other nonmanufacturing industries	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.
NA = Not available

NOTE: The character-of-work estimation procedure was revised for 1986 and later years; hence, these data are not directly comparable with data for 1985 and earlier years. See technical notes for a more complete discussion of this change.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1994

[illegible] and development, by industry and source of funds: 1995

Page 1 of 3

Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
All Industries		$132,103	$23,451	$108,652	$6,099	$720	$5,379	$27,454	$3,699	$23,755	$98,552	$19,031	$79,516
Manufacturing		100,067	18,831	81,236	3,849	290	3,559	20,416	2,140	18,276	75,804	16,399	59,401
Food, kindred, and tobacco products	20,21	1,566	0	1,566	153	0	153	510	0	510	903	0	903
Textiles and apparel	22,23	(D)	(D)	381	29	0	29	(D)	(D)	49	(D)	(D)	303
Lumber, wood products, and furniture	24,25	(D)	(D)	229	21	0	21	38	0	38	(D)	(D)	169
Paper and allied products	26	(D)	(D)	1,404	245 (S)	0	245 S)	(D)	(D)	720 (S)	439	0	439
Chemicals and allied products	28	17,547	210 (S)	17,337	(D)	(D)	1,616	(D)	(D)	5,666	10,241	187 (S)	10,055
Industrial chemicals	281–82,286	(D)	(D)	5,139	(D)	(D)	514	(D)	(D)	1,437	(D)	(D)	3,188
Drugs and medicines	283	10,215	14	10,202	1,018	2	1,016	3,513	5	3,508	5,683	7	5,677
Other chemicals	284–85, 287–89	(D)	(D)	1,996	(D)	(D)	86	(D)	(D)	720	(D)	(D)	1,190
Petroleum refining and extraction	13,29	1,760	6	1,754	115	0	115	(D)	(D)	719	(D)	(D)	920
Rubber products	30	(D)	(D)	1,210	67	0	67	(D)	(D)	229	(D)	(D)	915
Stone, clay, and glass products	32	448	6	441	17	0	17	(D)	(D)	151	(D)	(D)	273
Primary metals	33	593	13	580	47	0	47	(D)	(D)	184	(D)	(D)	349
Ferrous metals and products	331–32, 3398–99	(D)	(D)	217	14	0	14	85	0	85	(D)	(D)	118
Nonferrous metals and products	333–36	(D)	(D)	363	33	0	33	(D)	(D)	100	235	5	231
Fabricated metal products	34	1,023	86	937	(D)	(D)	68	156	13	143	(D)	(D)	726
Machinery	35	(D)	(D)	9,676	(D)	(D)	261	2,431	29	2,402	7,067	54	7,012
Office, computing, and accounting machines	357	(D)	(D)	4,699	(D)	(D)	24	(D)	(D)	1,323	(D)	(D)	3,352 S)
Other machinery, except electrical	351–56, 358–59	5,041	64	4,976	(D)	(D)	238	(D)	(D)	1,079	(D)	(D)	3,660

See explanatory information and SOURCE at end of table.

Table A-23a. Funds for performance of basic research, applied research, and development, by industry and source of funds: 1995-

Page 2 of 3

Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
Electrical equipment	36	$18,751	$1,690	$17,060	(D)	(D)	$240	$3,882	(D)	$3,279	$14,612	$1,070	$13,541
Radio and TV receiving equipment	365	(D)	(D)	114	$5	$0	5	16	$0	16	(D)	(D)	94
Communication equipment	366	(D)	(D)	3,845	56	0	56	(D)	(D)	664	3,644	519	3,125
Electronic components	367	(D)	(D)	9,628	(D)	(D)	88	2,435	430	2,005	7,705	169	7,535
Other electrical equipment	361–64,369	(D)	(D)	3,473	(D)	(D)	91	(D)	(D)	595	(D)	(D)	2,787
Transportation equipment	37	32,441	13,130	19,311	348	250	98	2,791	705	2,086	29,302	12,175	17,127
Motor vehicles and motor vehicles equipment	371	(D)	(D)	13,590	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	12,885
Other transportation equipment	373–75,379	(D)	(D)	232	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	179
Aircraft and missiles	372,376	16,951	11,462	5,489	252	250	2	1,987	564	1,423	14,712	10,648	4,064
Professional and scientific instruments	38	11,976	3,460 (S)	8,516	(D)	(D)	499	(D)	(D)	2,015	8,812	2,810 (S)	6,002
Scientific and mechanical measuring instruments	381–82	7,146	3,358 (S)	3,787	(D)	(D)	257	(D)	(D)	1,406	(D)	(D)	2,125
Optical, surgical, photographic, and other instruments	384–87	4,831	102	4,729	(D)	(D)	242	634	24	610	(D)	(D)	3,877
Other manufacturing industries	27,31,39	(D)	(D)	835	(D)	(D)	83	84	0	84	668	0	668
Nonmanufacturing		32,036	4,620	27,415	2,250	430	1,820	7,038	1,558	5,480	22,748	2,632	20,115
Transportation and utilities	40–42,44–49	5,435	252	5,183	(D)	(D)	116	(D)	(D)	953	4,359	245	4,114
Communications	48	(D)	(D)	4,756	(D)	0	(D)	(D)	0	(D)	(D)	(D)	3,852
Telephone communications	481	(D)	(D)	4,697	(D)	0	(D)	(D)	0	(D)	(D)	(D)	3,809
Other communications	482–484,489	59	0	59	(D)	0	(D)	(D)	0	(D)	43	0	43
Electric, gas, and sanitary services	49	440	93	347	(D)	(D)	48	(D)	(D)	105	280	86	194
Other transportation and utilities	40–42,44–47	(D)	(D)	80	(D)	0	(D)	(D)	(D)	(D)	(D)	(D)	68
Trade	50–59	(D)	(D)	7,514	(D)	(D)	211	(D)	(D)	1,236	(D)	(D)	6,067
Finance, insurance, and real estate	60–65,67	(D)	(D)	710	(D)	(D)	115	(D)	(D)	17	(D)	(D)	578

See explanatory information and SOURCE at end of table.

Table A-23a. Funds for performance of basic research, applied research, and development, by industry and source of funds: 1995

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Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
Services	701,72,73, 75–81,83, 84,87,89	$17,876	$4,270	$13,606	$1,766	$420	$1,346	$4,658	$1,537	$3,122	$11,452	$2,312	$9,138
Business services	73	9,293	612	8,681	(D)	(D)	(D)	(D)	(D)	(D)	6,972	276	6,695
Computer and data processing services	737	9,059	514	8,545	(D)	(D)	569	(D)	(D)	1,376	6,796	196	6,600
Other business services	731–736,738	234	98	136	(D)	(D)	(D)	(D)	(D)	(D)	175	80	95
Health services	80	756	4	753	(D)	(D)	(D)	237	2	235	(D)	(D)	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	(D)	(D)	737	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Other health services	802–805, 808–809	(D)	(D)	16 S)	1	(D)	(D)	(D)	(D)	(D)	7	0	7
Engineering and management services	87	7,662	3,650	4,011	(D)	(D)	(D)	(D)	(D)	(D)	3,887	2,034 (S)	1,852
Engineering, architectural, and surveying	871	2,933	1,883	1,050	(D)	(D)	(D)	(D)	(D)	(D)	1,519	1,079	440
Research, development, and testing	873	(D)	(D)	2,829	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1,287
Other engineering and management services	872,874	(D)	(D)	132	(D)	(D)	7	(D)	(D)	0	(D)	(D)	125
Other services	701,72,75–79,8,83, 84,89	165	4	160	(D)	(D)	(D)	29	3	26	(D)	(D)	(D)
Other nonmanufacturing industries	07–12,14,15, 161–162,17	413	11	402	32	0	32	(D)	(D)	153	(D)	(D)	217

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

NOTE: The character-of-work estimation procedure was revised for 1986 and later years; hence, these data are not directly comparable with data for 1985 and earlier years. See technical notes for a more complete discussion of this change.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

Table A-24a. Funds for performance of basic research, applied research, and development, by industry and source of funds: 1996

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Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
All Industries		$144,667	$23,653	$121,015	$8,207	$1,358	$6,848	$29,241	$3,871	$25,370	$107,218	$18,423 (S)	$88,798
Manufacturing		111,864	20,020	91,845	(D)	(D)	4,851	(D)	(D)	19,711	83,661	16,379	67,284
Food, kindred, and tobacco products	20,21	1,564	0	1,564	100	0	100	508	0	508	957	0	957
Textiles and apparel	22,23	(D)	(D)	414	50	0	50	(D)	(D)	43	(D)	(D)	321
Lumber, wood products, and furniture	24,25	(D)	(D)	634	37	0	37	(D)	(D)	122	475	0	475
Paper and allied products	26	(D)	(D)	1,534	313 (S)	0	313 (S)	(D)	(D)	706 (S)	(D)	(D)	515
Chemicals and allied products	28	(D)	(D)	17,520	1,628	8	1,620	(D)	(D)	5,667	(D)	(D)	10,233
Industrial chemicals	281–82,286	(D)	(D)	5,246	(D)	(D)	697	(D)	(D)	1,468	(D)	(D)	3,081
Drugs and medicines	283	9,773	3	9,769	(D)	(D)	856	(D)	(D)	3,157	5,758	2 (S)	5,755
Other chemicals	284–85, 287–89	2,505	0	2,505	67	0	67	1,041	0	1,041	1,396	0	1,396
Petroleum refining and extraction	13,29	1,654	24	1,630	(D)	(D)	(D)	592	2	590	(D)	(D)	(D)
Rubber products	30	(D)	(D)	1,269	(D)	(D)	67	(D)	(D)	251	(D)	(D)	951
Stone, clay, and glass products	32	468	5	463	(D)	(D)	21	(D)	(D)	162	(D)	(D)	280
Primary metals	33	(D)	(D)	637	(D)	(D)	(D)	(D)	(D)	167	754 (S)	(D)	(D)
Ferrous metals and products	331-32, 3398–99	(D)	(D)	214	6	(D)	(D)	(D)	0	(D)	(D)	(D)	(D)
Nonferrous metals and products	333–36	(D)	(D)	422	(D)	0	(D)	(D)	(D)	(D)	(D)	(D)	315
Fabricated metal products	34	(D)	(D)	1,322	(D)	(D)	140	(D)	(D)	247	(D)	(D)	934
Machinery	35	13,455	117	13,338	(D)	(D)	397	(D)	(D)	2,409	10,605	73	10,532
Office, computing, and accounting machines	357	(D)	(D)	8,132	(D)	(D)	65	(D)	(D)	1,629	(D)	(D)	6,438
Other machinery, except electrical	351–56, 358–59	(D)	(D)	5,206	(D)	(D)	332	(D)	(D)	780	(D)	(D)	4,094

See explanatory information and SOURCE at end of table.

Table A-24a. Funds for performance of basic research, applied research, and development, by industry and source of funds: 1996

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Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
Electrical equipment	36	$22,498	$2,143	$20,356	(D)	(D)	$531	(D)	(D)	$4,926	$15,662	$764	$14,898
Radio and TV receiving equipment	365	(D)	(D)	140	$22	(D)	(D)	(D)	0	(D)	(D)	(D)	107
Communication equipment	366	(D)	(D)	4,359	(D)	(D)	18	(D)	(D)	751	3,999	410	3,590
Electronic components	367	(D)	(D)	12,497	(D)	(D)	(D)	$4,799	(D)	(D)	8,767	116	8,651
Other electrical equipment	361–64,369	(D)	(D)	3,360	(D)	(D)	228	(D)	(D)	582	(D)	(D)	2,550
Transportation equipment	37	32,737	12,202	20,535	(D)	(D)	277	(D)	(D)	2,361	28,648	10,752 (S)	17,898
Motor vehicles and motor vehicles equipment	371	(D)	(D)	14,528	104	(D)	(D)	(D)	(D)	(D)	(D)	(D)	13,753
Other transportation equipment	373–75,379	(D)	(D)	298	(D)	$0	(D)	167	(D)	(D)	(D)	(D)	149
Aircraft and missiles	372,376	16,224	10,515	5,710	(D)	(D)	(D)	(D)	(D)	(D)	13,259	9,264 (S)	3,995
Professional and scientific instruments	38	12,149	3,942	8,207	(D)	(D)	943	1,099	$67	1,032	(D)	(D)	6,232
Scientific and mechanical measuring instruments	381–82	(D)	(D)	3,283	(D)	(D)	455	482	31	450	(D)	(D)	2,378
Optical, surgical, photographic, and other instruments	384–87	(D)	(D)	4,924	(D)	(D)	488	617	35	582	(D)	(D)	3,854
Other manufacturing industries 1/	27,31,39	(D)	(D)	2,423	(D)	(D)	247	973	455	518	1,738	80	1,658
Nonmanufacturing		32,803	3,633	29,170	(D)	(D)	1,997	(D)	(D)	5,659	23,557	2,044 (S)	21,514
Transportation and utilities	40–42,44–49	4,678	186	4,492	(D)	(D)	(D)	(D)	(D)	(D)	3,650	180	3,469
Communications	48	(D)	(D)	3,970	(D)	0	(D)	(D)	(D)	(D)	(D)	(D)	3,040
Telephone communications	481	(D)	(D)	3,897	(D)	0	(D)	(D)	(D)	(D)	(D)	(D)	2,982
Other communications	482–484,489	73	0	73	(D)	0	(D)	16	(D)	(D)	(D)	(D)	57

See explanatory information and SOURCE at end of table.

Table A-24a. Funds for the performance of basic research, applied research, and development, by industry and source of funds: 1996

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Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
Electric, gas, and sanitary services	49	$352	$42	$311	$15	$0	$15	(D)	(D)	$73	(D)	(D)	$223
Other transportation and utilities	40–42,44–47	(D)	(D)	211	(D)	(D)	(D)	(D)	$0	(D)	$221	$12	209
Trade	50-59	6,389	51 (S)	6,338	(D)	(D)	405	$1,462	0	1,462	(D)	(D)	4,471
Finance, insurance, and real estate	60-65,67	(D)	(D)	1,280	12	(D)	(D)	(D)	0	(D)	1,177	2	1,174
Services	701,72,73, 75–81,83, 84,87,89	19,022	3,118	15,904	1,699	360	1,339	3,952	1,006 (S)	2,946	13,371	1,752 (S)	11,619
Business services	73	10,641	361	10,280	593	84	509	1,328	51	1,277	8,720	226	8,494
Computer and data processing services	737	(D)	(D)	10,025	550	84	467	(D)	(D)	1,244	(D)	(D)	8,314
Other business services	731–736,738	(D)	(D)	255	41	0	41	(D)	(D)	33	(D)	(D)	181
Health services	80	(D)	(D)	735 (S)	(D)	(D)	50	(D)	(D)	252 (S)	(D)	(D)	433 (S)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	715 (S)	3	713 (S)	48	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Other health services	802–805, 808–809	(D)	(D)	23	(D)	0	(D)	12	(D)	(D)	(D)	0	(D)
Engineering and management services	87	7,318	2,746	4,572	1,029	274	757	2,324	949 (S)	1,376	3,965	1,523 (S)	2,439
Engineering, architectural, and surveying	871	1,660	994	667	(D)	(D)	(D)	(D)	(D)	(D)	943	546	398

See explanatory information and SOURCE at end of table.

Table A-24a. Funds for performance of basic research, applied research, and development, by industry and source of funds: 1996

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Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
Research, development, and testing	873	$5,484	$1,708 (S)	$3,776	$795	$128	$667	$1,772	$603 (S)	$1,168	$2,917	$977 (S)	$1,941
Other engineering and management services	872,874	173	45	129	(D)	(D)	(D)	(D)	(D)	(D)	101	1	101
Other services	701,72, 75–79,81, 83,84,89	(D)	(D)	317	(D)	(D)	25	(D)	(D)	42	(D)	(D)	250
Other nonmanufacturing industries 1/	07–12,14, 15,161–162, 17	(D)	(D)	1,156	46	0	46	547	218	329	(D)	(D)	781

1/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

NOTE: The character-of-work estimation procedure was revised for 1986 and later years; hence, these data are not directly comparable with data for 1985 and earlier years. See technical notes for a more complete discussion of this change.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

[illegible] basic research and total number of R&D-performing companies, by industry and size of company, 1996

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Industry	SIC code	Total		Size of company											
				Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic
All industries		34,569	8,211	31,519	7,520	1,132	278	1,324	282	292	49	175	50	127	33
Manufacturing		19,090	4,362	16,846	3,823	862	205	973	234	202	40	131	38	76	23
Food, kindred, and tobacco products	20,21	645	187	449	150	63	19	94	6	16	7	11	2	12	3
Textiles and apparel	22,23	451	106	317	70	65	17	51	15	9	2	8	1	1	1
Lumber, wood products, and furniture	24,25	429	27	356	3	23	11	33	10	11	1	4	1	2	0
Paper and allied products	26	197	24	107	1	11	7	57	9	6	1	10	3	6	3
Chemicals and allied products	28	618	117	430	52	52	19	89	25	22	9	17	8	8	4
Industrial chemicals	281–82,286	169	34	94	2	25	11	31	11	8	2	8	5	3	3
Drugs and medicines	283	100	18	58	2	6	2	22	7	5	3	6	3	3	1
Other chemicals	284–85,287–89	349	65	278	48	21	6	37	7	9	4	3	0	2	0
Petroleum refining and extraction	13,29	124	57	104	50	1	0	5	2	1	0	9	3	4	2
Rubber products	30	558	92	389	53	83	25	73	13	7	0	4	1	2	1
Stone, clay, and glass products	32	248	63	200	50	15	0	24	8	5	2	4	3	0	0
Primary metals	33	231	61	163	53	16	2	31	4	13	1	5	0	3	1
Ferrous metals and products	331–32,3398–99	137	57	102	50	3	2	21	4	9	1	2	0	1	0
Nonferrous metals and products	333–36	94	4	61	3	13	0	10	0	4	0	3	0	2	1
Fabricated metal products	34	1,005	251	823	196	91	35	68	16	10	1	11	3	1	0
Machinery	35	1,875	355	1,534	249	109	26	185	70	26	5	18	4	3	1
Office, computing, and accounting machines	357	151	9	114	2	12	0	12	3	7	2	5	1	1	1
Other machinery, except electrical	351–56,358–59	1,724	346	1,420	247	97	26	173	67	19	3	13	3	2	0
Electrical equipment	36	1,497	325	1,178	269	155	25	126	21	18	5	12	3	9	2
Radio and TV receiving equipment	365	51	5	42	4	5	0	3	1	1	0	0	0	0	0
Communication equipment	366	290	76	232	69	27	4	23	3	4	0	1	0	2	1
Electronic components	367	588	132	466	113	61	1	46	14	7	2	4	2	4	0
Other electrical equipment	361–64,369	569	111	437	83	62	20	54	3	6	3	7	1	3	1
Transportation equipment	37	346	66	204	50	52	0	25	5	40	3	10	4	16	4
Motor vehicles and motor vehicles equipment	371	179	7	100	0	51	0	9	1	8	1	7	4	4	1
Other transportation equipment	373–75,379	94	3	52	0	0	0	10	3	28	0	2	0	3	0
Aircraft and missiles	372,376	73	56	52	50	1	0	6	1	4	2	1	0	9	3

See explanatory information and SOURCE at end of table.

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Table A-25a. Number of companies conducting basic research and total number of R&D-performing companies, by industry and size of company: 1996

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Industry	SIC code	Total		Size of company: Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic
Professional and scientific instruments	38	877	100	727	68	61	13	72	14	10	3	2	1	5	1
Scientific and mechanical measuring instruments	381–82	468	59	395	42	39	12	27	5	3	0	1	0	3	0
Optical, surgical, photographic, and other instruments	384–87	409	41	332	26	22	1	45	9	7	3	1	1	2	1
Other manufacturing industries 1/	27,31,39	9,990	2,531	9,865	2,508	65	7	41	15	9	0	6	1	4	0
Nonmanufacturing		15,479	3,849	14,674	3,697	270	73	351	48	90	9	44	12	51	10
Transportation and utilities	40–42,44–49	274	20	167	1	4	0	53	14	20	1	13	3	18	1
Communications	48	38	2	22	0	2	0	3	1	1	0	0	0	10	1
Telephone communications	481	11	1	0	0	0	0	0	0	1	0	0	0	10	1
Other communications	482–484,489	27	1	22	0	2	0	3	1	0	0	0	0	0	0
Electric, gas, and sanitary services	49	122	17	43	1	2	0	45	12	18	1	11	3	3	0
Other transportation and utilities	40–42,44–47	114	1	102	0	0	0	4	1	1	0	2	0	5	0
Trade	50–59	2,950	815	2,695	751	119	52	91	5	31	5	5	1	9	2
Finance, insurance, and real estate	60–65,67	308	56	210	53	3	2	73	0	10	0	2	0	10	1
Services	701,72,73, 75–81,83,84, 87,89	4,896	1,084	4,601	1,030	124	19	111	19	23	2	24	8	13	6
Business services	73	2,750	541	2,564	524	90	7	63	7	19	2	8	0	7	1
Computer and data processing services	737	2,366	447	2,217	435	81	5	52	6	8	2	6	0	2	0
Other business services	731–736,738	384	94	347	90	8	2	11	1	11	0	2	0	5	1
Health services	80	351	87	337	83	4	2	6	0	1	0	3	2	0	0
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	317	59	307	55	3	2	4	0	0	0	3	2	0	0
Other health services	802–805, 808–809	34	28	30	28	1	0	2	0	1	0	0	0	0	0

See explanatory information and SOURCE at end of table.

Table A-25a. Number of companies conducting basic research and total number of R&D-performing companies, by industry and size of company: 1996

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Industry	SIC code	Total		Size of company											
				Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic
Engineering and management services	87	1,413	346	1,342	321	27	8	33	12	1	0	5	0	5	4
Engineering, architectural, and surveying	871	593	108	557	101	11	0	21	7	1	0	3	0	0	0
Research, development, and testing	873	661	212	639	201	12	7	4	0	0	0	1	0	5	4
Other engineering and management services	872,874	159	26	145	20	4	1	8	5	0	0	1	0	0	0
Other services	701,72,75–79, 81,83,84,89	382	110	359	102	3	2	9	0	2	0	8	6	1	1
Other nonmanufacturing industries 1/	07–12,14,15, 161–162,17	7,051	1,874	7,000	1,862	19	1	23	10	6	1	1	0	1	0

1/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not comparable with statistics for prior years.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

Table A-26. Number of full-time-equivalent (FTE) R&D scientists and engineers in R&D-performing companies, by industry and size of company: 1986–97

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Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Projected 1997
		[In thousands]											
Total (January)		671.0	695.8	708.6	722.5	743.6	773.4	779.3	764.7	768.5	746.1	832.8	885.7
Total (Annual average)		683.4	702.2	715.6	733.0	758.5	776.4	772.0	766.6	758.8	789.4	859.3	NA
All Industries		671.0	695.8	708.6	722.5	743.6	773.4	779.3	764.7	768.5	746.1	832.8	885.7
Distribution by industry:													
Manufacturing		595.9	599.4	606.7	597.3	NA	NA	576.7	568.2	571.1	547.2	606.2	639.9
Food, kindred, and tobacco products	20,21	(S)	(S)	(S)	(S)	(S)	9.4	9.8	9.6	10.3	8.9	9.8	10.4
Textiles and apparel	22,23	2.6	2.4	2.4	2.5	2.8	(S)	2.8	3.1	3.3	2.9	3.8	3.7
Lumber, wood products, and furniture	24,25	(S)	1.3	1.3	1.4	(S)	(S)	1.5	1.6	3.3	2.3	2.9	3.4
Paper and allied products	26	6.4	6.0	6.1	6.4	8.5	(S)	10.7	10.6	10.6	10.6	11.0 (S)	11.2 (S)
Chemicals and allied products	28	75.8	75.2	75.8	78.3	80.4	81.6	85.6	86.5	93.1	99.6	94.3	89.0
Industrial chemicals	281–82,286	24.9	(S)	(S)	(S)	(S)	(S)	29.9	26.4	28.8	33.7	28.4	31.2
Drugs and medicines	283	31.8	32.6	33.0	34.4	34.3	35.4	38.7	42.3	48.5	50.3	49.0	43.1
Other chemicals	284–85,287–89	19.1	20.2	20.3	18.8	18.9	17.0	17.0	17.8	15.8	15.6	16.9	14.8
Petroleum refining and extraction	13,29	10.4	9.9	9.5	10.7	11.1	11.4	11.5	11.0	9.7	8.4	8.4	9.0
Rubber products	30	(S)	(S)	(S)	(S)	(S)	(S)	14.8	13.0	9.0	9.8	10.2	9.9
Stone, clay, and glass products	32	7.5	8.6	8.6	7.6	7.0	6.0	5.3	5.1	4.0	4.3	3.9	3.7
Primary metals	33	5.7	5.5	5.6	5.5	5.2	4.6	5.1	4.6	5.1	6.5	4.1	5.5 (S)
Ferrous metals and products	331–32, 3398–99	2.5	(S)	2.3	2.3	(S)	(S)	1.7	1.6	2.6	1.9	1.6	1.6
Nonferrous metals and products	333–36	3.2	3.4	3.3	3.3	3.3	3.0	(S)	(S)	2.5	4.6	2.5	3.9 (S)
Fabricated metal products	34	(S)	9.9	10.5	9.9	10.1	(S)	8.7	7.9	10.2	9.2	9.1	10.0
Machinery	35	89.7	95.8	98.4	100.4	113.3	109.7	99.3	97.4	70.4	68.6	87.3	88.7
Office, computing, and accounting machines	357	71.9	73.4	74.4	75.0	84.7	77.6	67.1	65.8	34.6	31.8	33.7	45.3
Other machinery, except electrical	351–56,358–59	17.8	22.4	24.0	25.4	28.6	32.1	32.2	31.6	35.8	36.8	53.6	43.4
Electrical equipment	36	117.9	130.4	132.5	122.5	105.2	95.9	91.9	89.2	96.5	103.3	125.8	135.9
Radio and TV receiving equipment	365	1.8	1.2	1.3	1.5	0.8	1.0	1.0	1.0	0.8	0.9	1.3	1.6
Communication equipment	366	65.0	71.9	73.1	58.0	47.1	35.8	31.2	(S)	36.0 (S)	41.7 (S)	34.7 (S)	37.6 (S)
Electronic components	367	(S)	43.7	44.3	42.8	(S)	32.6	28.4	26.9	40.1	40.8	64.6 (S)	75.3 (S)
Other electrical equipment	361–64,369	16.5	13.6	(S)	(S)	21.3	(S)	31.2	28.8	19.6	20.0	25.3	21.4

See explanatory information and SOURCE at end of table.

Table A-26a. Number of full-time-equivalent (FTE) R&D scientists and engineers in R&D-performing companies, by industry and size of company: 1986–97

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Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Projected 1997
		[In thousands]											
Distribution by industry:													
Transportation equipment	37	179.2	187.3	188.2	185.4	170.2	149.7	141.1	147.5	129.6	120.8	156.6	161.6 (S)
Motor vehicles and motor vehicles equipment	371	33.9	46.5	47.3	45.8	49.4	45.3	44.5	45.1	51.0	51.1	57.0	63.8
Other transportation equipment	373–75,379	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	5.8 (S)	6.2	4.0	3.4
Aircraft and missiles	372,376	144.8	136.3	136.4	134.8	115.3	100.2	92.9	97.9	72.8	63.5	95.5	94.6 (S)
Professional and scientific instruments	38	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	100.6 (S)	84.4	70.9 (S)	64.3 (S)
Scientific and mechanical measuring instruments	381–82	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	66.4 (S)	63.2	48.2 (S)	42.6 (S)
Optical, surgical, photographic, and other instruments	384–87	24.0	24.6	24.9	14.5	8.1	(S)	(S)	20.8	34.2	21.2	22.7	21.7
Other manufacturing industries 1/	27,31,39	(S)	6.3	6.4	5.4	5.6	(S)	6.0	5.8	15.5	7.5	8.2	33.4
Nonmanufacturing 2/		75.1	96.4	101.9	125.2	(S)	(S)	202.6	196.5	197.4	198.9	226.6	245.8
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	29.3	29.4
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	25.4	24.7
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24.7	23.9
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.8	0.8
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.2 (S)	4.0 (S)
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.7	0.8
Trade	50-59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	47.5	39.6
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.6	15.9
Services	701,72,73, 75–81,83,84, 87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	139.6	143.9
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	80.2	87.8
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	77.3	85.1
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.0	2.8

See explanatory information and SOURCE at end of table.

[illegible] Number of full-time-equivalent (FTE) R&D scientists and engineers in R&D-performing companies, by industry and size of company: 1986–97

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Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Projected 1997
		[In thousands]											
Distribution by industry:													
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.0	6.6
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.4	6.3
Other health services	802–805, 808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.6	0.3 (S)
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	52.9	45.3
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	22.8 (S)	18.0
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	28.8	24.9
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4	2.3 (S)
Other services	701,72,75-79, 81,83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.5	4.2
Other nonmanufacturing industries 1/	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.6	17.0

See explanatory information and SOURCE at end of table.

[illegible] (FTE) R&D scientists and engineers in R&D-performing companies, by industry and size of company, 1986-97

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Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Projected 1997
		[In thousands]											
Distribution by size of company: [Number of employees]													
Total	....	671.0	695.8	708.6	722.5	743.6	773.4	779.3	764.7	768.5	746.1	832.8	885.7
Fewer than 500	....	(S)	105.2	109.0	105.4	(S)	(S)	142.1	125.1	148.6	139.8	165.1	177.3
500 to 999	....	(S)	18.4	19.3	18.0	18.6	18.6	46.2	46.1	27.9	29.7	36.6	37.7
1,000 to 4,999	....	66.7	76.4	81.9	76.1	75.4	79.3	94.2	99.3	108.9	110.8	124.4	131.6
5,000 to 9,999	....	38.9	40.5	40.2	47.3	57.2	55.1	57.6	56.4	60.3	52.8	61.1	82.2
10,000 to 24,999	....	88.4	92.0	94.5	87.0	73.9	90.3	99.9	102.6	90.6	91.8	97.0	104.9
25,000 or more	....	365.3	363.3	363.7	388.7	404.2	408.4	339.2	335.2	332.1	321.2	348.6	351.9 (S)

1/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not comparable with statistics for prior years.

2/ Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY: (S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.
NA = Not available

NOTE: As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

Table A-27a. Cost per R&D scientist or engineer in R&D-performing companies, by industry and size of company: 1986–96

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Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
		[Cost in dollars]										
All industries		$128,500	$128,800	$132,300	$134,500	$141,300	$148,600	$157,912	$153,336	$157,601	$167,339	$168,362
Distribution by industry:												
Manufacturing		NA	NA	NA	NA	NA	NA	NA	NA	NA	173,523	179,538
Food, kindred, and tobacco products	20,21	(D)	(S)	(D)	(D)	(D)	130,000	144,215	135,261	153,609	167,017	154,853
Textiles and apparel	22,23	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Lumber, wood products, and furniture	24,25	(S)	(S)	(D)	(S)	(S)	(D)	(D)	(D)	(D)	(D)	(D)
Paper and allied products	26	(D)	(D)	(D)	(S)	(S)	(D)	(D)	(D)	(D)	(D)	(D)
Chemicals and allied products	28	117,100	125,000	139,400	149,000	159,000	167,600	183,508	(D)	(D)	180,971	(D)
Industrial chemicals	281–82,286	150,200	(S)	(S)	(S)	(S)	181,000	193,871	(D)	(D)	(D)	(D)
Drugs and medicines	283	113,600	(D)	142,800	(D)	(D)	(D)	196,631	202607	195,145	205,637	212,185
Other chemicals	284–85, 287–89	83,100	(D)	105,600	(D)	(D)	(D)	135,423	(D)	(D)	(D)	158,355
Petroleum refining and extraction	13,29	(D)	187,400	182,700	194,000	201,800	217,000	205,318	208360	209,439	209,495	189,981
Rubber products	30	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Stone, clay, and glass products	32	118,000	122,500	(D)	(D)	(D)	(D)	(D)	137990	141,842	110,172	124,685
Primary metals	33	(D)	131,500	118,600	(S)	(D)	142,200	114,057	138552	116,556	111,743	(D)
Ferrous metals and products	331–32, 3398–99	(D)	(D)	(S)	(D)	(D)	(D)	(D)	138851	(D)	(D)	(D)
Nonferrous metals and products	333–36	138,800	(D)	(S)	(D)	(D)	(D)	(D)	138326 (S)	(D)	(D)	(D)
Fabricated metal products	34	(S)	76,600	88,100	(S)	(S)	115,500	123,828	129,131	113,168	112,010	(D)
Machinery	35	(D)	(D)	(D)	130,000	138,500	147,800	152,797	100,631	118,717	(D)	152,894
Office, computing, and accounting machines	357	(D)	(D)	(D)	(D)	(D)	(D)	(D)	99,564	126,476	(D)	(D)
Other machinery, except electrical	351–56, 358–59	119,200	98,300	99,400	(D)	(D)	(D)	(D)	102,213	111,691	111,421	(D)

See explanatory information and SOURCE at end of table.

Table A-27a. Cost per R&D scientist or engineer in R&D-performing companies, by industry and size of company: 1986–96

Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
		[Cost in dollars]										
Distribution by industry:												
Electrical equipment	36	$120,700	$124,300	$124,100	$132,400	$142,800	$147,100	$150,118	$144,725	$151,872	$163,626	$171,907
Radio and TV receiving equipment	365	88,700	97,900	124,200	103,400	113,200	(D)	(D)	(D)	(D)	(D)	(D)
Communication equipment	366	141,300	155,300	160,300	170,600	177,100	(S)	(D)	(D)	(D)	(D)	(D)
Electronic components	367	(D)	98,400	(S)	(S)	128,400	(D)	127,801	154,366	148,761	(D)	(D)
Other electrical equipment	361–64,369	(D)	(S)	68,500	(S)	(S)	(D)	(D)	(D)	(D)	(D)	(D)
Transportation equipment	37	170,700	183,400	195,600	211,700	215,700	189,400	191,274	196,777	228,881	233,968	205,665 (S)
Motor vehicles and motor vehicles equipment	371	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Other transportation equipment	373–75,379	(S)	(S)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Aircraft and missiles	372,376	149,800	180,400	193,300	207,300	213,700	177,000	180,552	176,450	217,219	213,328	170,733 (S)
Professional and scientific instruments	38	(S)	(S)	(S)	(S)	(S)	(S)	(S)	115,180 (S)	119,693 (S)	154,251	179,723 (S)
Scientific and mechanical measuring instruments	381–82	(D)	(D)	(S)	(S)	(S)	(S)	(S)	94,036 (S)	102,570 (S)	128,237	(D)
Optical, surgical, photographic, and other instruments	384–87	(D)	(D)	316,700	(S)	(S)	(S)	(S)	161,721	161,435	220,383	(D)
Other manufacturing industries 1/	27,31,39	(S)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Nonmanufacturing 2/		86,800	69,100	74,900	(S)	(S)	137,400	152,411	159,188	142,125	150,578	138,882
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA	370,933	159,442
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA	157,435	94,495

See explanatory information and SOURCE at end of table.

Table A-27a. Cost per R&D scientist or engineer in R&D-performing companies, by industry and size of company: 1986–96

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Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
		[Cost in dollars]										
Distribution by industry:												
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	$274,704 (S)	$98,427 (S)
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Trade	50–59	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	146,774
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Services	701,72,73, 75–81,83,84, 87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	256,085	134,175
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	231,680	126,625
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA	234,483	(D)
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA	158,453	(D)
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA	305,132	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	133,871 (S)
Other health services	802–805, 808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	289,459	149,040
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA	257,067 (S)	81,271 (S)
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	204,445
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	93,929 (S)

See explanatory information and SOURCE at end of table.

Table A-27a. Cost per R&D scientist or engineer in R&D-performing companies, by industry and size of company: 1986-96

Page 4 of 4

Industry and size of company	SIC code	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
		[Cost in dollars]										
Distribution by industry:												
Other services	701,72, 75–79,81, 83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	$221,147	(D)
Other nonmanufacturing industries 1/	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA	179,020	(D)
Distribution by size of company: [Number of employees]												
Total		$128,500	$128,800	$132,300	$134,500	$141,300	$148,600	$157,912	$153,336	$157,601	167,339	$168,362
Fewer than 500		70,600	66,800	67,100	66,200	(S)	103,400	111,358	106,888	85,793	109,319	118,280
500 to 999		103,400	92,600	(S)	98,200	(S)	178,700	176,585	87,233	138,366	141,660	124,765
1,000 to 4,999		106,400	91,900	100,600	101,900	91,400	119,400	127,135	128,565	139,693	144,213	142,747
5,000 to 9,999		108,400	102,900	100,400	102,500	110,800	150,800	148,285	156,899	152,227	167,284	161,035
10,000 to 24,999		122,300	132,700	143,000	127,300	135,300	167,300	156,190	160,229	182,243	180,849	199,722
25,000 or more		154,300	157,700	160,700	168,200	193,700	180,100	182,839	184,804	195,890	200,606	199,286 (S)

1/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not comparable with statistics for prior years.

2/ Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.
NA = Not available.

NOTES: The number of full-time-equivalent R&D scientists and engineers used to estimate the cost per R&D scientist or engineer is the arithmetic mean of the numbers of R&D scientists and engineers reported for January in two consecutive years. This number is then divided into the total R&D expenditures of the earlier years, and the ratio is attributed to the earlier year.

As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

Table A-28a. Cost per R&D scientist or engineer in R&D-performing companies, by industry and size of company: 1996

Page 1 of 3

Industry	SIC code	Total	Size of company: Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Cost in dollars]					
All industries		$168,362	$118,280	$124,765	$142,747	$161,035	$199,722	$199,286 (S)
Manufacturing		179,538	100,356	120,849	151,400	171,027	207,460	208,384 (S)
Food, kindred, and tobacco products	20,21	154,853	43,326	99,214	121,688	152,799 (S)	214,611	211,539
Textiles and apparel	22,23	(D)	79,239	130,295	116,198	160,804	116,930 (S)	(D)
Lumber, wood products, and furniture	24,25	(D)	85,110	84,086	51,336	74,733 (S)	(D)	(D)
Paper and allied products	26	(D)	70,554	154,889	187,840	274,760	174,944 (S)	(D)
Chemicals and allied products	28	(D)	75,033	134,247	180,490	277,036	(D)	189,060
Industrial chemicals	281–82,286	(D)	125,558	151,973	215,790	211,603	220,758	(D)
Drugs and medicines	283	212,185	85,362	126,020	177,742	438,744	214,247	192,276
Other chemicals	284–85,287–89	158,355	50,024	109,505	135,800	124,984 (S)	(D)	(D)
Petroleum refining and extraction	13,29	189,981	227,572	(D)	145,993	(D)	173,971	206,783 (S)
Rubber products	30	(D)	81,471	111,683	152,177	180,618 (S)	162,649 (S)	(D)
Stone, clay, and glass products	32	124,685	31,908	109,094	105,245	182,036 (S)	158,894	0
Primary metals	33	(D)	101,648	71,770	114,503 (S)	199,905	(D)	(D)
Ferrous metals and products	331–32,3398–99	(D)	111,595	(D)	100,756 (S)	(D)	(D)	(D)
Nonferrous metals and products	333–36	(D)	96,414	(D)	132,050 (S)	(D)	(D)	(D)
Fabricated metal products	34	(D)	64,880	102,584	107,276	100,059	175,557	(D)
Machinery	35	152,894	69,659 (S)	115,617	112,147	114,602	(D)	(D)
Office, computing, and accounting machines	357	(D)	138,243	135,523 (S)	99,338	141,952	(D)	(D)
Other machinery, except electrical	351–56,358–59	(D)	55,407 (S)	106,581	120,708	92,081 (S)	240,771	(D)
Electrical equipment	36	171,907	121,229	108,362	168,418	184,663	148,699 (S)	200,604 (S)
Radio and TV receiving equipment	365	(D)	88,302	128,679 (S)	(D)	(D)	0	0
Communication equipment	366	(D)	123,728	78,397	137,796	(D)	(D)	(D)
Electronic components	367	(D)	124,239	122,025	219,327	216,712	(D)	(D)
Other electrical equipment	361–64,369	(D)	116,406	138,867	(D)	155,522	147,076	(D)
Transportation equipment	37	205,665 (S)	66,491	255,441 (S)	109,137	154,870 (S)	116,967	212,829 (S)
Motor vehicles and motor vehicles equipment	371	(D)	(D)	(D)	107,376	(D)	220,208	(D)
Other transportation equipment	373–75,379	(D)	(D)	(D)	149,929	(D)	(D)	(D)
Aircraft and missiles	372,376	170,733 (S)	(D)	(D)	89,345	199,764 (S)	(D)	172,212 (S)

See explanatory information and SOURCE at end of table.

Table A-25. Cost per R&D scientist or engineer in R&D-performing companies, by industry and size of company: 1996

Industry	SIC code	Total	Size of company: Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[Cost in dollars]						
Professional and scientific instruments	38	$179,723 (S)	$82,628	$137,706	$174,039	$251,413	(D)	(D)
Scientific and mechanical measuring instruments	381–82	(D)	77,407	159,941	151,566	(D)	(D)	$173,679 (S)
Optical, surgical, photographic, and other instruments	384–87	(D)	93,307	96,153	201,782	(D)	(D)	(D)
Other manufacturing industries 1/	27,31,39	(D)	155,694	(D)	105,502	(D)	$130,475 (S)	74,256
Nonmanufacturing		138,882	134,237	131,883	122,551	132,456	170,444	149,786
Transportation and utilities	40–42,44–49	159,442	231,511	(D)	94,975	(D)	83,641 (S)	168,894
Communications	48	(D)	66,521	(D)	(D)	(D)	0	167,954
Telephone communications	481	(D)	(D)	0	(D)	(D)	0	167,954
Other communications	482–484,489	94,495	67,972	(D)	(D)	0	0	0
Electric, gas, and sanitary services	49	98,427 (S)	(D)	(D)	107,985	(D)	(D)	(D)
Other transportation and utilities	40–42,44–47	(D)	(D)	0	(D)	(D)	(D)	(D)
Trade	50–59	146,774	156,067	199,631	140,785	191,388	(D)	(D)
Finance, insurance, and real estate	60–65,67	(D)	123,714	(D)	(D)	(D)	(D)	100,562
Services	701,72,73,75–81, 83,84,87,89	134,175	126,713	135,898	(D)	131,521	176,692	(D)
Business services	73	126,625	101,471	124,171	124,642	131,221	(D)	(D)
Computer and data processing services	737	(D)	104,466	122,734	124,537	(D)	(D)	(D)
Other business services	731–736,738	(D)	52,945	191,554 (S)	129,831	(D)	(D)	158,579
Health services	80	(D)	27,385	(D)	108,267 (S)	(D)	(D)	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	133,871 (S)	27,354	(D)	(D)	0	(D)	(D)
Other health services	802-805,808–809	(D)	27,842	(D)	(D)	(D)	0	0
Engineering and management services	87	149,040	169,309	191,725	63,489	(D)	(D)	(D)
Engineering, architectural, and surveying	871	81,271 (S)	118,590	80,024	75,470	(D)	(D)	(D)
Research, development, and testing	873	204,445	197,925	242,928	(D)	0	(D)	(D)
Other engineering and management services	872,874	93,929 (S)	100,884	(D)	(D)	(D)	(D)	0

See explanatory information and SOURCE at end of table.

Table A-29. Cost per R&D scientist or engineer in R&D-performing companies, by industry and size of company: 1996

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Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Cost in dollars]					
Other services	701,72,75–79,81, 83,84,89	(D)	$30,504	(D)	(D)	(D)	(D)	(D)
Other nonmanufacturing industries 1/	07–12,14,15, 161–162, 17	(D)	152,016	$23,278	$134,395	$159,513	(D)	(D)

1/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.

NOTES: The number of full-time-equivalent R&D scientists and engineers used to estimate the cost per R&D scientist or engineer is the arithmetic mean of the numbers of R&D scientists and engineers reported for January in two consecutive years. This number is then divided into the total R&D expenditures of the earlier years, and the ratio is attributed to the earlier year.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

[illegible] employment of R&D-performing companies, by industry and size of company, 1995–96

Page 1 of 5

Industry	SIC code	Total	Size of company: Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[In thousands]						
		1995						
All Industries		17,759	1,935	835	2,735	1,916	2,649	7,689
Manufacturing		11,220	1,279	570	2,121	1,250	1,994	4,008
Food, kindred, and tobacco products	20,21	1,017	66	29	196	84	182	459
Textiles and apparel	22,23	387	27	30	96	(D)	141	(D)
Lumber, wood products, and furniture	24,25	234	39	23	76	47	(D)	(D)
Paper and allied products	26	547	14	11	89	50	146	237
Chemicals and allied products	28	1,211	109	45	207	283	288	278
Industrial chemicals	281–82,286	424	25	27	74	35	136	127
Drugs and medicines	283	348	21	7	64	22	(D)	(D)
Other chemicals	284–85,287–89	439	64	10	70	227	(D)	(D)
Petroleum refining and extraction	13,29	324	7	(D)	33	(D)	142	127
Rubber products	30	485	127	53	124	52	(D)	(D)
Stone, clay, and glass products	32	173	25	18	52	19	58	0
Primary metals	33	465	22	24	133	104	77	104
Ferrous metals and products	331–32,3396–99	264	6	8	86	(D)	(D)	(D)
Nonferrous metals and products	333-36	200	16	16	47	(D)	(D)	(D)
Fabricated metal products	34	593	139	49	137	57	212	0
Machinery	35	1,172	224	95	306	157	200	191
Office, computing, and accounting machines	357	195	23	11	59	44	(D)	(D)
Other machinery, except electrical	351–56,358–59	977	201	85	246	113	(D)	(D)
Electrical equipment	36	1,384	178	80	274	101	173	579
Radio and TV receiving equipment	365	23	6	2	15	0	0	0
Communication equipment	366	236	47	21	55	(D)	(D)	(D)
Electronic components	367	454	58	30	108	(D)	(D)	(D)
Other electrical equipment	361–64,369	671	66	26	96	41	91	350
Transportation equipment	37	2,009	65	30	145	103	136	1,530
Motor vehicles and motor vehicles equipment	371	1,069	55	25	105	64	(D)	(D)
Other transportation equipment	373–75,379	153	(D)	3 (S)	19	0	55	(D)
Aircraft and missiles	372,376	786	(D)	2	21	38	(D)	700

See explanatory information and SOURCE at end of table.

Table A-29a. Domestic employment of R&D-performing companies, by industry and size of company: 1995–96

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Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[In thousands]						
		1995						
Professional and scientific instruments	38	710	163	(D)	149	63	(D)	246
Scientific and mechanical measuring instruments	381–82	358	91	(D)	54	18	(D)	(D)
Optical, surgical, photographic, and other instruments	384–87	352	72	40	95	45	(D)	(D)
Other manufacturing industries	27,31,39	512	73	19	103	73	152	91
Nonmanufacturing		6,538	656	265	614	666	655	3,681
Transportation and utilities	40–42,44–49	2,061	(D)	(D)	158	132	222	1,525
Communications	48	895	3	(D)	46	(D)	0	840
Telephone communications	481	887	(D)	0	(D)	(D)	0	840
Other communications	482–484,489	8	(D)	(D)	(D)	0	0	0
Electric, gas, and sanitary services	49	501	(D)	0	103	119	(D)	(D)
Other transportation and utilities	40–42,44–47	664	(D)	0	9	(D)	(D)	(D)
Trade	50–59	1,869	303	16	137	259	91	1,063
Finance, insurance, and real estate	60–65,67	415	(D)	44	47	115	(D)	(D)
Services	701,72,73,75–81, 83,84,87,89	1,865	307	73	238	122	269	855
Business services	73	1,258	155	50	155	67	112	720
Computer and data processing services	737	518	133	(D)	130	46	(D)	85
Other business services	731–736,738	740	22	(D)	25	21	(D)	634
Health services	80	140	29	(D)	15	0	52	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	116	26	(D)	8	0	(D)	(D)
Other health services	802–805,808–809	24	3	(D)	7 (S)	0	(D)	0
Engineering and management services	87	324	107	(D)	53	23	59	(D)
Engineering, architectural, and surveying	871	202	42	11	42	(D)	(D)	(D)
Research, development, and testing	873	73	50	4	(D)	0	(D)	0
Other engineering and management services	872,874	49	15	(D)	(D)	(D)	(D)	0

See explanatory information and SOURCE at end of table.

Table A-29a. Domestic employment of R&D-performing companies, by industry and size of company: 1995-96

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Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[In thousands]						
		1995						
Other services	701,72,75–79,81, 83,84,89	142	17	(D)	16	31	47	(D)
Other nonmanufacturing industries	07–12,14,15, 161–162,17	329	20	(D)	34	38	(D)	(D)
		1996						
All Industries		18,102	1,831	806	2,838	2,041	2,734	7,852
Manufacturing		11,347	1,251	618	2,095	1,377	2,021	3,984
Food, kindred, and tobacco products	20,21	1,085	51	40	217	114	161	500
Textiles and apparel	22,23	430	53	(D)	105	59	141	(D)
Lumber, wood products, and furniture	24,25	331	45	(D)	74	67	(D)	(D)
Paper and allied products	26	560	18	7	100	41	155	239
Chemicals and allied products	28	1,049	64	38	198	168	281	301
Industrial chemicals	281–82,286	444	19	20	75	61	129	140
Drugs and medicines	283	304	6	(D)	53	40	105	(D)
Other chemicals	284–85,287–89	301	38	(D)	70	67	47	(D)
Petroleum refining and extraction	13,29	286	10	(D)	17	(D)	133	121
Rubber products	30	453	67	57	145	(D)	58	(D)
Stone, clay, and glass products	32	190	21	10	67	33	60	0
Primary metals	33	406	42	10	68	96	88	102
Ferrous metals and products	331–32,3398–99	208	26	(D)	42	63	(D)	(D)
Nonferrous metals and products	333–36	198	16	(D)	26	33	(D)	(D)
Fabricated metal products	34	604	121	(D)	139	65	157	(D)
Machinery	35	1,322	197	77	399	183	279	186
Office, computing, and accounting machines	357	278	15	(D)	26	44	65	(D)
Other machinery, except electrical	351–56,358–59	1,044	182	(D)	373	140	214	(D)
Electrical equipment	36	1,388	170	115	269	133	210	491
Radio and TV receiving equipment	365	29	8	4	10	(D)	0	0
Communication equipment	366	231	33	20	54	(D)	(D)	(D)

See explanatory information and SOURCE at end of table.

Table A-29a Domestic employment of R&D-performing companies, by industry and size of company: 1995–96

Page 4 of 5

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[In thousands]						
		1996						
Electronic components	367	551	69	49	108	48	(D)	(D)
Other electrical equipment	361–64,369	576	60	42	97	45	116	217
Transportation equipment	37	1,948	22	39	58	231	131	1,468
Motor vehicles and motor vehicles equipment	371	959	(D)	(D)	23	55	87	744
Other transportation equipment	373–75,379	284	(D)	0	19	(D)	(D)	85
Aircraft and missiles	372,376	705	6	(D)	17	(D)	(D)	639
Professional and scientific instruments	38	608	98	(D)	152	71	(D)	219
Scientific and mechanical measuring instruments	381–82	294	50	28	57	20	(D)	(D)
Optical, surgical, photographic, and other instruments	384–87	314	48	(D)	95	51	(D)	(D)
Other manufacturing industries 1/	27,31,39	686	273	48	85	62	91	128
Nonmanufacturing		6,755	580	188	743	664	713	3,868
Transportation and utilities	40–42,44–49	2,017	17	3	140	147	191	1,518
Communications	48	826	5	(D)	(D)	(D)	0	(D)
Telephone communications	481	815	0	0	0	(D)	0	(D)
Other communications	482–484,489	11	5	(D)	(D)	0	0	0
Electric, gas, and sanitary services	49	593	5	(D)	127	132	(D)	167
Other transportation and utilities	40–42,44–47	599	8	0	9 (S)	(D)	(D)	542
Trade	50–59	1,577	166	75	163	238	87	849
Finance, insurance, and real estate	60–65,67	724	12	2	163	81	(D)	(D)
Services	701,72,73,75–81, 83,84,87,89	2,219	312	92	239	151	393	1,033
Business services	73	1,422	161	70	139	119	143	790
Computer and data processing services	737	540	143	65	113	50	(D)	(D)
Other business services	731–736,738	882	17	5	26	69	(D)	(D)

See explanatory information and SOURCE at end of table.

Table A-29a. Domestic employment of R&D-performing companies, by industry and size of company: 1995-96

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[In thousands]						
		1996						
Health services	80	91	15	(D)	13	(D)	50	0
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	74	14	(D)	(D)	0	50	0
Other health services	802–805,808–809	17 (S)	2	(D)	(D)	(D)	0	0
Engineering and management services	87	507	123	(D)	67	(D)	76	(D)
Engineering, architectural, and surveying	871	140	41	(D)	43	(D)	44	0
Research, development, and testing	873	302	53	(D)	5	0	(D)	(D)
Other engineering and management services	872,874	65	29	(D)	19	0	(D)	0
Other services	701,72,75–79,81, 83,84,89	199	13	2	20	(D)	123	(D)
Other nonmanufacturing industries 1/	07–12,14,15, 161–162,17	218	73	15	38	46	(D)	(D)

1/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

[illegible] funds for industrial R&D performance [illegible] manufacturing and nonmanufacturing [illegible] company: 1996

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Distribution by size of company: [Number of employees]	Total	Manufacturing	Nonmanufacturing
	Funds for industrial R&D [Dollars in millions]		
Total	$144,667	$111,864	$32,803
Fewer than 500	20,249	8,092	12,157
500 to 999	4,637	2,898	1,739
1,000 to 4,999	18,273	13,568	4,705
5,000 to 9,999	11,537	9,079	2,458
10,000 to 24,999	20,164	16,566	3,597
25,000 or more	69,808	61,662	8,146
	Number of R&D-performing companies		
Total	34,569	19,090	15,479
Fewer than 500	31,519	16,846	14,674
500 to 999	1,132	862	270
1,000 to 4,999	1,324	973	351
5,000 to 9,999	292	202	90
10,000 to 24,999	175	131	44
25,000 or more	127	76	51

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

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SURVEY METHODOLOGY[1]

REPORTING UNIT

The reporting unit for the Survey of Industrial Research and Development is the enterprise, firm, or company, all used synonymously, and defined as a business organization of one or more establishments under common ownership or control. The survey includes two groups of enterprises: (1) companies known to conduct R&D, and (2) a sample representation of companies for which information on the extent of R&D activity is uncertain.

FRAME CREATION

The Standard Statistical Establishment List (SSEL), a Bureau of the Census compilation that contains information on more than 3 million establishments with paid employees, was the target population from which the frames used to select the 1995 and 1996 survey samples were created (see tables B-1 and B-1a for target population and sample sizes). For companies with more than one establishment, data were summed to the company level. The firm was then assigned a single standard industrial classification (SIC) code based on the activity of the establishment(s) having the highest dollar value of payroll. This assignment was done on a hierarchical basis. The enterprise was first assigned to the economic division (manufacturing or nonmanufacturing) with the highest payroll, then to the two-digit SIC code with the highest payroll within the assigned division, then to the three-digit SIC code with the highest payroll within the assigned two-digit industry.

The frames from which the survey samples were drawn included all for-profit companies classified in nonfarm industries. For surveys prior to 1992, the frame was limited to companies above certain size criteria based on number of employees.[2] These criteria varied by industry. Also, some industries were excluded from the frame because it was believed that these industries contributed little or no R&D activity to the final survey estimates. For the 1992 sample, new industries were added to the frame[3] and the size criteria were lowered considerably and applied uniformly to firms in all industries. As a result, nearly 2 million enterprises with 5 or more employees were given a chance of selection. For comparison, the frame for the 1987 sample included 154,000 companies of specified sizes and industries. The frames used to select the 1995 and 1996 samples were similar to the ones used to select the 1992, 1993, and 1994 samples.

A fundamental change, initiated in 1995 and repeated in 1996, was the redefinition of the sampling strata. For the survey years 1992 through 1994, 165 sampling strata were established—each stratum corresponding to one or more three-digit level SIC codes. The objective was to select sufficient representation of industries to determine whether alternative or expanded publication levels were warranted. The strata for the 1995 and 1996 surveys were defined to correspond to publication-level industry aggregations. A total of 40 such levels were defined, corresponding to the original 25 groupings of manufacturing industries used as strata in sample designs before 1992 and to 15 new groupings of nonmanufacturing industries. Companies were assigned to strata based on their three-digit SIC codes.

The criteria for identifying companies selected with certainty for the survey were further modified in 1996. With a fixed total sample size, there was some concern that the representation of the very large noncertainty universe by a smaller sample each year would be inadequate. Prior to 1994, companies with 1,000 or more employees had been selected with certainty, but it was observed that the level of spending varied considerably and that many of these companies reported no R&D expenditures each year. For these reasons, beginning in 1995, these companies were given chances of selection based upon the size of their R&D spending if they were in the previous survey or upon an estimated R&D value if they were not. To further limit the growth occurring each year in the number of certainty cases within the

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[1] Information for this section was provided by the Manufacturing and Construction Division of the Bureau of the Census, the collecting and compiling agent for the National Science Foundation (NSF). Copies of the technical papers cited can be obtained by contacting NSF's Research and Development Statistics Program in the Division of Science Resources Studies at the address given in section A, Introduction.

[2] See the Bureau of the Census technical memorandum entitled "Evaluation of Total Employment Cut-Offs in the Survey of Industrial Research and Development," Nov 3, 1994.

[3] These industries are listed and discussed later in this section under Comparability of Statistics.

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Table B-1. Number of companies in the target population and selected for the sample, by industry: 1995

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Industry	SIC code	Companies in target population	1995 survey			Companies reporting R&D expenditures for 1995 3/		Companies reporting no R&D expenditures for 1995 4/
			Companies selected for 1995 sample	Noncertainties 1/	Certainties 2/	Greater than or equal to $1 million	Less than $1 million	
All Industries		1,877,631	23,809	18,444	5,365	3,076	1,578	14,540
Manufacturing		199,237	7,595	4,923	2,672	2,126	1,032	3,256
Food, kindred, and tobacco products	20,21	10,139	238	150	88	79	24	93
Textiles and apparel	22,23	16,368	224	150	74	53	38	85
Lumber, wood products, and furniture	24,25	23,786	300	206	94	31	76	135
Paper and allied products	26	3,289	226	140	86	59	23	104
Chemicals and allied products	28	5,050	426	177	249	237	68	77
Industrial chemicals	281–82,286	881	132	49	83	81	18	24
Drugs and medicines	283	787	120	40	80	75	14	19
Other chemicals	284–85,287–89	3,382	174	88	86	81	36	34
Petroleum refining and extraction	13,29	6,030	96	65	31	28	3	58
Rubber products	30	9,202	546	428	118	104	106	233
Stone, clay, and glass products	32	7,246	378	283	95	37	58	235
Primary metals	33	3,684	291	188	103	67	52	123
Ferrous metals and products	331–32,3398–99	1,832	106	66	40	28	22	39
Nonferrous metals and products	333–36	1,852	185	122	63	39	30	84
Fabricated metal products	34	21,906	768	566	202	125	169	337
Machinery	35	30,517	782	402	380	388	90	221
Office, computing, and accounting machines	357	29,352	645	376	269	107	9	9
Other machinery, except electrical	351–56,358–59	1,165	137	26	111	281	81	212
Electrical equipment	36	9,290	845	373	472	442	113	166
Radio and TV receiving equipment	365	387	75	37	38	17	20	22
Communication equipment	366	1,083	182	49	133	130	15	11
Electronic components	367	3,897	326	163	163	166	40	71
Other electrical equipment	361–64,369	3,923	262	124	138	129	38	62
Transportation equipment	37	5,638	278	183	95	94	23	125
Motor vehicles and motor vehicles equipment	371	2,596	159	111	48	49	18	77
Other transportation equipment	373–75,379	2,134	45	26	19	18	1	19
Aircraft and missiles	372,376	908	74	46	28	27	4	29

See explanatory information and SOURCE at end of table.

Table B-1. Number of companies in the target population and selected for the sample, by industry: 1995

Page 2 of 3

Industry	SIC code	Companies in target population	1995 survey			Companies reporting R&D expenditures for 1995 3/		Companies reporting no R&D expenditures for 1995 4/
			Companies selected for 1995 sample	Noncertainties 1/	Certainties 2/	Greater than or equal to $1 million	Less than $1 million	
Professional and scientific instruments	38	5,984	423	114	309	299	52	43
Scientific and mechanical measuring instruments	381–82	2,957	211	55	156	157	27	14
Optical, surgical, photographic, and other instruments	384–87	3,027	212	59	153	142	25	29
Other manufacturing industries	27,31,39	41,108	1,774	1,498	276	83	137	1,221
Nonmanufacturing		1,678,394	16,214	13,521	2,693	950	546	11,284
Transportation and utilities	40–42,44–49	74,718	1,067	815	252	80	29	705
Communications	48	8,072	556	417	139	20	13	398
Telephone communications	481	2,317	105	91	14	13	1	65
Other communications	482–484,489	5,755	451	326	125	7	12	333
Electric, gas, and sanitary services	49	3,067	194	111	83	45	13	103
Other transportation and utilities	40–42,44–47	63,579	317	287	30	15	3	204
Trade	50–59	656,166	2,564	2,393	171	138	37	1,692
Finance, insurance, and real estate	60–65,67	113,046	1,778	1,527	251	31	16	1,391
Services	701,72,73,75–81, 83,84,87,89	586,197	9,865	7,874	1,991	677	448	6,862
Business services	73	101,560	2,161	1,732	429	307	142	1,223
Computer and data processing services	737	16,895	1,095	836	259	292	106	424
Other business services	731–736,738	84,665	1,066	896	170	15	36	799
Health services	80	170,698	1,328	1,190	138	18	18	1,027
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	81,538	586	545	41	15	10	448
Other health services	802–805,808–809	89,160	742	645	97	3	8	579

See explanatory information and SOURCE at end of table.

Table B-1. Number of companies in the target population and selected for the sample, by industry: 1995

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Industry	SIC code	Companies in target population	1995 survey: Companies selected for 1995 sample	1995 survey: Noncertainties 1/	1995 survey: Certainties 2/	Companies reporting R&D expenditures for 1995 3/: Greater than or equal to $1 million	Companies reporting R&D expenditures for 1995 3/: Less than $1 million	Companies reporting no R&D expenditures for 1995 4/
Engineering and management services	87	69,892	4,902	3,596	1,306	333	266	3,508
Engineering, architectural, and surveying	871	23,863	4,176	3,041	1,135	149	226	3,137
Research, development, and testing	873	5,515	485	338	147	177	38	189
Other engineering and management services	872,874	40,514	241	217	24	7	2	182
Other services	701,72,75–79, 81,83,84,89	244,047	1,474	1,356	118	19	22	1,104
Other nonmanufacturing industries	07–12,14,15, 161–162,17	248,267	940	912	28	24	16	634

1/ Noncertainties are companies whose probability of selection is less than one.

2/ Certainties are companies whose probability of selection is one. This includes companies whose 1994 R&D expenditures are equal to or greater than $1 million.

3/ This includes Form RD-1L companies for which total R&D expenditure data were imputed.

4/ Does not include companies that did not respond to the survey or that did not indicate any information about R&D performance on a returned questionnaire.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

Table B-1a. Number of companies in the target population and selected for the sample, by industry: 1996

Page 1 of 3

Industry	SIC code	Companies in target population	1996 survey: Companies selected for 1996 sample	1996 survey: Noncertainties 1/	1996 survey: Certainties 2/	Companies reporting R&D expenditures for 1996 3/: Greater than or equal to $1 million	Companies reporting R&D expenditures for 1996 3/: Less than $1 million	Companies reporting no R&D expenditures for 1996 4/
All Industries		1,936,702	24,964	21,920	3,044	2,864	1,105	16,334
Manufacturing		203,984	4,780	3,328	1,452	1,706	571	1,816
Food, kindred, and tobacco products	20,21	2,700	182	110	72	77	26	54
Textiles and apparel	22,23	4,110	246	170	76	56	42	108
Lumber, wood products, and furniture	24,25	3,418	170	112	58	34	54	64
Paper and allied products	26	1,215	74	42	32	48	4	20
Chemicals and allied products	28	1,265	221	62	159	183	13	14
Industrial chemicals	281–82,286	314	71	15	56	63	1	5
Drugs and medicines	283	272	55	2	53	50	1	0
Other chemicals	284–85,287–89	679	95	45	50	70	11	9
Petroleum refining and extraction	13,29	2,164	62	44	18	20	2	32
Rubber products	30	2,750	254	157	97	108	55	58
Stone, clay, and glass products	32	1,253	90	46	44	38	19	27
Primary metals	33	1,283	105	50	55	60	14	22
Ferrous metals and products	331–32,3398–99	695	48	19	29	26	10	9
Nonferrous metals and products	333–36	588	57	31	26	34	4	13
Fabricated metal products	34	4,659	308	202	106	117	68	94
Machinery	35	4,625	454	249	205	281	57	77
Office, computing, and accounting machines	357	313	65	8	57	57	1	1
Other machinery, except electrical	351–56,358–59	4,312	389	241	148	224	56	76
Electrical equipment	36	2,876	481	237	244	323	52	61
Radio and TV receiving equipment	365	109	34	11	23	16	8	3
Communication equipment	366	361	114	54	60	91	8	3
Electronic components	367	1,262	140	44	96	106	10	18
Other electrical equipment	361–64,369	1,144	193	128	65	110	26	37

See explanatory information and SOURCE at end of table.

Table B-4a. Number of companies in the target population and selected for the sample, by industry: 1996

Page 2 of 3

Industry	SIC code	Companies in target population	1996 survey: Companies selected for 1996 sample	1996 survey: Noncertainties 1/	1996 survey: Certainties 2/	Companies reporting R&D expenditures for 1996 3/: Greater than or equal to $1 million	Companies reporting R&D expenditures for 1996 3/: Less than $1 million	Companies reporting no R&D expenditures for 1996 4/
Transportation equipment	37	1,495	96	35	61	67	5	18
Motor vehicles and motor vehicles equipment	371	792	45	16	29	30	2	10
Other transportation equipment	373–75,379	472	24	15	9	14	2	5
Aircraft and missiles	372,376	231	27	4	23	23	1	3
Professional and scientific instruments	38	1,359	304	165	139	215	33	20
Scientific and mechanical measuring instruments	381–82	657	144	70	74	112	14	7
Optical, surgical, photographic, and other instruments	384–87	702	160	95	65	103	19	13
Other manufacturing industries 5/	27,31,39	168,812	1,733	1,647	86	79	127	1,147
Nonmanufacturing		1,732,718	20,184	18,592	1,592	1,158	534	14,518
Transportation and utilities	40–42,44–49	24,798	841	663	178	74	50	606
Communications	48	4,130	176	135	41	19	5	115
Telephone communications	481	1,142	34	23	11	11	0	14
Other communications	482–484,489	2,988	142	112	30	8	5	101
Electric, gas, and sanitary services	49	1,387	251	127	124	43	42	122
Other transportation and utilities	40–42,44–47	19,281	414	401	13	12	3	369
Trade	50–59	233,247	4,957	4,878	79	112	49	3,788
Finance, insurance, and real estate	60–65,67	33,046	816	751	65	36	9	689
Services	701,72,73,75-81, 83,84,87,89	157,314	6,907	5,705	1,202	903	371	4,577
Business services	73	42,883	2,174	1,744	430	412	157	1,156
Computer and data processing services	737	7,420	1,195	857	338	389	134	415
Other business services	731–736,738	35,463	979	887	92	23	23	741
Health services	80	37,911	965	910	55	20	14	787
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	19,903	573	531	42	15	11	456
Other health services	802–805,808–809	18,008	392	379	13	5	3	331

See explanatory information and SOURCE at end of table.

Table B-1. Number of companies in the target population and selected for the sample, by industry: 1996

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Industry	SIC code	Companies in target population	1996 survey: Companies selected for 1996 sample	1996 survey: Noncertainties 1/	1996 survey: Certainties 2/	Companies reporting R&D expenditures for 1996 3/: Greater than or equal to $1 million	Companies reporting R&D expenditures for 1996 3/: Less than $1 million	Companies reporting no R&D expenditures for 1996 4/
Engineering and management services	87	23,385	2,650	1,952	698	453	188	1,614
Engineering, architectural, and surveying	871	8,520	1,227	920	307	148	113	798
Research, development, and testing	873	2,744	861	565	296	295	61	364
Other engineering and management services	872,874	12,121	562	467	95	10	14	452
Other services	701,72,75–79,81, 83,84,89	53,135	1,118	1,099	19	18	12	1,020
Other nonmanufacturing industries 5/	07–12,14,15, 161–162,17	1,284,313	6,663	6,595	68	33	55	4,858

1/ Noncertainties are companies whose probability of selection is less than one.

2/ Certainties are companies whose probability of selection is one. This includes companies whose 1996 R&D expenditures are equal to or greater than $5 million.

3/ This includes R&D-1S companies for which total R&D expenditure data were imputed.

4/ Does not include companies that did not respond to the survey or that did not indicate any information about R&D performance on a returned questionnaire.

5/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not comparable with statistics for prior years.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

total sample, the certainty criterion (the size of their R&D spending) was raised for the 1996 survey from $1 million to $5 million.

The partitioning of the frame into "large" and "small" company components and the use of simple random sampling (SRS) for the small company partition were retained for 1995, but the method of partitioning was changed for 1996. This feature was first introduced in 1994 because of concern in a study of 1992 survey results, which showed that a disproportionate number of small companies were being selected for the sample, often with very large weights. These small companies seldom reported R&D activity. This disproportion was a result of the minimum probability rule (see below) used as part of the independent probability proportionate to size (PPS) sampling procedure employed exclusively prior to 1994. This rule increased the probabilities of selection for several hundred thousand of these smaller companies. With SRS, these smaller companies can be sampled more efficiently than with independent PPS sampling since there is little variability in their size.

For 1995, total company payroll was the basis for the split between "large/small" partitions. For each industry grouping, the largest companies representing the top 90 percent of the total payroll for the industry grouping were included in the PPS frame. The balance of smaller companies comprising the remaining 10 percent of payroll for the industry grouping were included in the SRS frame. A benefit of this design change was a reduction in the maximum allowable weight for selected companies (weighting and maximum weights are discussed below).

For 1996, total company employment was the basis for the split between partitions. The total company employment levels defining the partitions were based on the relative contribution to total R&D expenditures of companies in different employment size groups in both the manufacturing and nonmanufacturing sectors. In the manufacturing sector, all companies with total employment of 50 or more were included in the large company partition. In the nonmanufacturing sector, all companies with total employment of 15 or more were included in the large company partition. Companies in the respective sectors with employment below these values were included in the small company partition. The large company partition contained about 560,000 companies and the small company partition about 1.3 million companies. These counts were comparable to those in the 1995 partition (656,000 and 1.2 million, respectively).

One final modification in the frame development for 1996 was the designation of "zero industries" in the large company partition. Zero industries were those three-digit SIC industries having no R&D expenditures reported in the survey years 1992–94—the years when estimates by three-digit SIC industry were formed. It was decided to keep these industries in the scope of the survey, but to draw only a limited sample from them since it seemed unlikely that R&D expenditures would be reported. SRS was used to control the number of companies selected within these industries.

SAMPLE SELECTION

PROBABILITY PROPORTIONATE TO SIZE

For 1995, the distribution of companies by payroll and estimated R&D in the large partition of the sample was skewed as in earlier frames. Because of this skewness, PPS sampling used in previous designs was an appropriate selection technique for this group. That is, large companies had a higher probability of selection than did small companies. For this survey it would have been ideal if company size could have been determined by its R&D expenditures. Unfortunately, except for the companies that were in a previous survey or for which there was information from external sources, it was impossible to know the R&D expenditures for every firm in the universe. Consequently, the probability of selection for most companies was based on estimated R&D expenditures.

Since total payroll was known for each company in the universe, it was possible to estimate R&D from payroll using relationships derived from 1995 survey data. Imputation factors relating these two variables were made for each industry grouping. To impute R&D for a given company, the imputation factors were applied to the company payroll in each industry grouping. A final measure was obtained by adding the industry grouping components. The effect, in general, was to give firms with large payrolls higher probabilities of selection in agreement with the assumption that larger companies were more likely to perform R&D.

Estimated R&D values were computed for companies in the small company partition as well. The aggregate of reported and estimated R&D from each company in both the large and small company partitions represented a total universe measure of 1995 R&D expenditures. However, assigning R&D to every company resulted in an overstatement of this measure. To adjust for the overstatement, the universe measure was scaled down using factors developed from the relationship of the universe measure of 1994 R&D and the 1994 survey estimate. These factors, computed at levels corresponding to published industry levels, were used to adjust originally imputed R&D values so that the new frame total for R&D at these levels approximated the 1994 published values. This adjustment provided for better allocation of the sample among these levels.

A significant revision in the procedure for selecting samples from the partitions changed the development and presentation of estimates from the 1996 survey. A sample of companies in the large company partition was selected using PPS sampling in each of the 40 strata as in 1995. The sample of companies in the small company partition was selected using SRS in only 2 strata rather than 40 as in 1995. Companies classified in manufacturing industries were selected to represent the group of all manufacturing industries rather than each manufacturing industry group. Likewise, companies classified in nonmanufacturing industries were selected to represent the group of all nonmanufacturing industries.

The purpose of selecting small companies from only two strata was to reduce the variability in industry estimates contributed from the random year-to-year selection of the companies in an industry and the associated high sampling weights. Consequently, estimates for industry groups within manufacturing and nonmanufacturing are not possible from these two strata. The statistics for the detailed industry groups are based only on the sample from the large company partition. Estimates from the small company partition are included in statistics for total manufacturing, total nonmanufacturing, and all industries. For completeness, the estimates also are added to the categories "other manufacturing" and "other nonmanufacturing."

Simple Random Sampling

Only two strata were defined for samples in the small company partition, manufacturing and nonmanufacturing. The use of SRS implied that each company within a stratum had an equal probability of selection. The total sample allocated to the small company partition was dependent upon the total sample specified for the survey and upon the total sample necessary to satisfy criteria established for the large company partition. Once determined, the allocation of this total by stratum was made proportionate to the stratum's payroll contribution to the entire partition.

Sample Stratification and Relative Standard Error Constraints

The particular sample selected for each survey year was one of a large number of the same type and size that by chance might have been selected. Statistics resulting from the different samples would differ somewhat from each other. These differences are represented by estimates of sampling error. The smaller the sampling error, the more precise the statistic.

The large company partition was of primary concern, since it was believed that nearly all of the R&D activity would be identified from this sector. To control sampling error in the statistics resulting from this portion of the frame, parameters were specified to allocate the sample across various levels, or strata, that corresponded to the 40 industry groupings discussed earlier. These parameters permitted the sample size to be varied to achieve a desired level of sampling error for each stratum and were assigned so that estimated errors of total R&D expenditures for industries in these strata did not exceed certain levels. Sample sizes among the strata were constrained only by the limit placed on the total sample size dictated by the available budget.

The practice, first implemented in the 1995 survey and continued in the 1996 survey, of establishing sampling strata corresponding to published industry groupings meant that more efficient samples could be selected for these groups than had resulted when using the 165-strata design. Even the expansion of the number of nonmanufacturing publication groupings resulted in fewer sampling strata. The earlier designs defined 25 strata of three-digit-SIC manufacturing industries, but published only one category of nonmanufacturing industries. In the 1995 and 1996 designs, 15 nonmanufacturing strata were defined for sampling and for publication levels. Since there was no mandate in either year to make a major reduction in the 1994 sample size of 17,600 for the large company partition, it was possible to establish much tighter relative standard error constraints on the smaller number of sampling strata. Thus, in 1996, 33 strata were assigned a relative standard error constraint of 1 percent while 7 strata were assigned a relative standard error constraint of ½ percent. These constraints resulted in an expected sample size of about 8,900 companies from the large company partition. The minimum probability rule (see below) was adjusted so as to raise the expected sample size closer to the 18,000 level.

A limitation of the sample allocation process for the large partition should be noted. The sampling errors used to control the sample size in each stratum are based on a universe total that, in large part, was improvised. That is, as previously noted, an R&D value was assigned to every company in the frame, even though most of these companies actually may not have had R&D expenditures. The value assigned was imputed for the majority of companies in the frame and, as a consequence, the estimated universe total and the distribution of individual company values, even after scaling, did not necessarily reflect the true distribution. Estimates of sampling variability were nevertheless based on this distribution. The presumption was that actual variation in the sample design would be less than that estimated, because many of the sampled companies have true R&D values of zero, not the widely varying values that were imputed using total payroll as a predictor of R&D. Previous sample selections indicate that in general this presumption holds, but exceptions have occurred when companies with large sampling weights have reported large amounts of R&D spending. Thus, in general, the 1-percent and ½-percent error levels described earlier are conservative. See tables B-2 and B-2a for the actual standard error estimates for selected items by industry.

For the 1995 small company partition, the same 40 strata were identified. Also included was a separate stratum of approximately 6,260 companies that could not be classified into an SIC code and therefore could not be assigned to a stratum because of incomplete industry identification in the SSEL. As was done for 1994, a small number of companies was selected from this group in the hopes that an accurate industry identification could be obtained at a later point. The initial sample size specified for the small company partition was 5,500 companies. The sample initially allocated to a given stratum was proportionate to its share of total payroll for the small partition. For the 1996 small company partition, two strata (manufacturing and nonmanufacturing) were identified. As for 1994 and 1995, a small number of companies was selected from the group of unclassifiable companies. Ultimately, a final sample of 6,466 companies was selected from the small company partition. The sample initially allocated to the two strata was proportionate to its share of total payroll for the small company partition.

In addition to sampling error, the estimates are subject to nonsampling error. Errors are grouped into five categories: specification, coverage, response, nonresponse, and processing. For detailed discussions on the sources, control, and measurement of each of these types of error, see the technical reports.[4]

Sample Size

The target sample size initially specified for the 1995 and 1996 surveys was 24,000 companies, and, as described above, was based primarily on compliance with predetermined sampling error constraints established for the large partition. The actual sample size for 1995 was 23,752 and for 1996 was 24,964 companies. These samples differed from the target for several reasons. First, the frames for the large company partition in both samples were subjected to independent sampling. Each company in the frames had an independent chance of selection, based on its assigned probability, i.e., selection of a company was completely independent of the selection of any other company. In independent (or Poisson) sampling, sample size itself is a random variable and the actual sample size will vary around the target or "expected" sample size. Theoretically, a sample of size zero or a sample the size of the entire universe is possible, but the probabilities of these extremes are so small that these are nearly impossible situations. In strata where the expected sample size is 50+, the actual sample probably will be within a fairly narrow range so that increased variability is not a real problem. However, in strata where the expected sample is small (i.e., less than 10) it is possible to grossly over or undersample the strata. In practice, the size of the originally drawn sample is usually quite close to the specified size. However, if there is too much deviation, the selection can be repeated until it is closer to the target.

Second, a minimum probability rule was imposed for both partitions in both the 1995 and 1996 samples. As noted earlier, for the large company partition, probabilities of selection proportionate to size were assigned each company, where size is the reported or imputed R&D value assigned to each company. Selected companies received a sample weight that was the inverse of their probability of selection. Selected companies that

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[4] U.S. Department of Commerce, Bureau of the Census, *Documentation of Nonsampling Issues in the Survey of Industrial Research and Development,* RR94/03 (Washington, DC, Sept. 1994) and U.S. Department of Commerce, Bureau of the Census, *A Study of Processing Errors in the Survey of Industrial Research and Development,* ESMD-9403 (Washington, DC, Sept. 1994).

Table B-2. Relative standard error of estimate (percentage) for selected items, by industry and size of company: 1995

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Industry and size of company	SIC code	Number of R&D-performing companies	Domestic net sales of R&D performers	Domestic employment of R&D performers	Number of FTE scientists and engineers	Total R&D	Company and other funds for R&D	Company-financed R&D performed outside of U.S.	Company-financed R&D contracted to outside organizations	Federal funds for R&D	Total funds for basic research	Total funds for applied research	Total funds for development
			[Percent]										
All Industries		4,654	2.0%	1.7%	1.4%	0.6%	0.6%	0.5%	2.3%	1.0%	3.6%	1.7%	0.7%
Distribution by industry:													
Manufacturing		3,158	2.4	1.7	1.6	0.6	0.7	0.3	1.5	0.3	2.5	1.4	0.8
Food, kindred, and tobacco products	20,21	103	2.5	6.2	12.7	6.5	6.5	0.0	1.7	0.0	32.2	13.7	4.0
Textiles and apparel	22,23	91	5.8	5.1	13.4	8.7	8.7	6.3	13.9	0.0	1.1	15.6	13.2
Lumber, wood products, and furniture	24,25	107	10.9	9.1	17.9	10.7	10.8	0.0	4.5	0.0	5.0	22.3	13.3
Paper and allied products	26	82	1.2	1.6	1.2	0.8	0.8	0.2	64.5	0.0	1.1	1.5	1.9
Chemicals and allied products	28	305	13.6	12.3	3.1	0.5	0.5	0.8	0.7	5.1	1.8	0.4	0.4
Industrial chemicals	281–82,286	99	3.8	3.6	2.8	1.5	1.6	2.8	0.0	0.0	1.0	0.7	0.5
Drugs and medicines	283	89	1.0	2.2	0.8	0.2	0.2	0.0	0.1	50.9	2.6	0.3	0.3
Other chemicals	284–85, 287–89	117	35.9	33.7	16.3	2.1	2.0	0.0	4.3	99.4	13.3	2.0	2.4
Petroleum refining and extraction	13,29	31	0.3	1.7	0.3	0.6	0.6	0.0	0.0	0.0	0.0	1.8	0.0
Rubber products	30	210	13.7	8.8	4.3	3.1	3.3	0.2	6.5	0.0	13.7	3.2	4.4
Stone, clay, and glass products	32	95	2.3	3.1	12.0	2.1	2.2	0.0	10.4	0.0	6.5	1.9	2.8
Primary metals	33	119	3.6	8.0	1.7	1.0	1.0	6.7	3.1	8.2	8.2	0.8	1.9
Ferrous metals and products	331–32, 3398–99	50	6.1	13.9	2.4	0.8	0.8	12.8	1.7	0.0	4.8	1.0	1.0
Nonferrous metals and products	333–36	69	2.3	2.5	2.2	1.5	1.5	0.0	5.0	11.5	13.7	1.4	3.5
Fabricated metal products	34	294	2.4	3.5	5.4	2.9	3.1	0.2	11.2	3.6	14.6	3.1	3.8

See explanatory information and SOURCE at end of table.

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Table B-2. Relative standard error of estimate (percentage) for selected items, by industry and size of company: 1995

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Industry and size of company	SIC code	Number of R&D-performing companies	Domestic net sales of R&D performers	Domestic employment of R&D performers	Number of FTE scientists and engineers	Total R&D	Company and other funds for R&D	Company-financed R&D performed outside of U.S.	Company-financed R&D contracted to outside organizations	Federal funds for R&D	Total funds for basic research	Total funds for applied research	Total funds for development
			[Percent]										
Distribution by industry:													
Machinery	35	478	14.6%	2.6%	9.6%	2.4%	2.5%	1.6%	12.3%	0.8%	7.0%	7.7%	2.5%
Office, computing, and accounting machines	357	116	1.9	2.8	2.2	2.1	2.1	0.0	0.0	0.0	29.5	0.0	3.1
Other machinery, except electrical	351–56, 358–59	362	18.6	3.0	15.6	4.3	4.4	2.0	21.1	1.1	7.0	18.1	4.0
Electrical equipment	36	555	2.2	1.7	2.5	2.0	2.2	0.6	22.0	1.9	8.5	4.1	3.7
Radio and TV receiving equipment	365	37	1.5	2.4	4.7	2.3	2.3	3.7	32.3	0.0	0.0	6.0	2.9
Communication equipment	366	145	8.5	5.6	3.2	2.9	3.2	0.1	10.5	5.9	28.8	13.9	3.0
Electronic components	367	206	4.4	3.4	3.7	2.5	2.6	1.1	56.3	1.9	12.6	3.4	6.4
Other electrical equipment	361–64,369	167	1.6	1.9	6.6	6.3	7.3	0.0	2.8	0.0	4.0	7.1	9.3
Transportation equipment	37	117	1.6	2.5	0.4	0.2	0.3	0.0	0.7	0.0	13.0	0.3	0.1
Motor vehicles and motor vehicles equipment	371	67	2.2	4.6	1.0	0.4	0.4	0.0	0.5	0.0	40.9	0.3	0.2
Other transportation equipment	373–75,379	19	0.8	1.0	0.6	0.4	1.0	0.0	84.4	0.0	0.0	0.0	0.5
Aircraft and missiles	372,376	31	0.4	0.7	0.2	0.0	0.1	0.0	0.0	0.0	1.5	0.5	0.0
Professional and scientific instruments	38	351	3.3	3.8	3.3	2.5	3.5	1.0	13.5	0.9	7.8	3.5	3.1
Scientific and mechanical measuring instruments	381–82	184	3.5	4.1	4.4	2.8	5.2	0.0	23.4	0.9	13.7	3.1	3.6
Optical, surgical, photographic, and other instruments	384–87	167	5.7	6.5	4.8	4.5	4.6	1.1	16.3	0.0	6.1	11.3	5.3
Other manufacturing industries	27,31,39	220	2.3	3.0	7.2	2.2	2.2	3.7	5.1	0.0	4.4	4.6	2.9

See explanatory information and SOURCE at end of table.

Table B-2. Relative standard error of estimate (percentage) for selected items, by industry, and size of company: 1995

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Industry and size of company	SIC code	Number of R&D-performing companies	Domestic net sales of R&D performers	Domestic employment of R&D performers	Number of FTE scientists and engineers	Total R&D	Company and other funds for R&D	Company-financed R&D performed outside of U.S.	Company-financed R&D contracted to outside organizations	Federal funds for R&D	Total funds for basic research	Total funds for applied research	Total funds for development
			[Percent]										
Distribution by industry:													
Nonmanufacturing		1,496	3.6%	3.7%	2.4%	1.6%	1.5%	2.5%	7.8%	5.2%	8.3%	4.9%	1.4%
Transportation and utilities	40–42,44–49	109	2.9	2.6	2.2	1.1	1.2	0.0	3.6	0.0	30.1	4.0	0.9
Communications	48	33	2.5	4.6	2.4	0.8	0.8	0.0	6.0	0.0	0.8	0.1	0.9
Telephone communications	481	14	2.6	4.6	2.3	0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.9
Other communications	482–484,489	19	3.0	6.8	29.7	9.8	9.8	0.0	79.0	0.0	53.3	5.6	12.0
Electric, gas, and sanitary services	49	58	7.2	6.8	6.1	11.3	14.3	0.0	4.2	0.0	74.4	37.5	1.4
Other transportation and utilities	40–42,44–47	18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trade	50–59	175	7.4	10.4	6.0	2.7	2.7	2.3	29.2	0.0	27.2	9.5	1.9
Finance, insurance, and real estate	60–65,67	47	10.9	9.2	9.6	13.1	13.2	0.0	0.0	95.3	74.5	41.2	6.1
Services	701,72,73, 75–81,83,84, 87,89	1,125	11.4	2.3	3.1	2.5	2.5	5.1	7.0	5.6	8.3	7.1	2.7
Business services	73	449	4.6	2.9	4.1	3.1	2.6	9.9	15.4	27.7	11.4	10.8	3.0
Computer and data processing services	737	398	5.4	6.9	4.0	3.1	2.6	9.9	15.0	30.2	11.5	11.0	2.9
Other business services	731–736,738	51	3.6	1.0	38.9	29.8	10.2	0.0	88.5	70.0	76.5	35.2	42.1
Health services	80	36	9.2	9.0	20.8	12.6	12.6	0.0	14.5	0.0	5.7	4.1	19.6
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	25	9.6	10.7	22.5	12.8	12.9	0.0	14.7	0.0	5.9	3.7	19.9
Other health services	802–805, 808–809	11	14.2	9.1	52.1	27.6	30.0	0.0	0.0	0.0	0.0	49.6	21.0

See explanatory information and SOURCE at end of table.

Table B-2. Relative standard error of estimate (percentages) for selected items, by industry and size of company: 1995

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Industry and size of company	SIC code	Number of R&D-performing companies	Domestic net sales of R&D performers	Domestic employment of R&D performers	Number of FTE scientists and engineers	Total R&D	Company and other funds for R&D	Company-financed R&D performed outside of U.S.	Company-financed R&D contracted to outside organizations	Federal funds for R&D	Total funds for basic research	Total funds for applied research	Total funds for development
			[Percent]										
Distribution by industry:													
Engineering and management services	87	599	26.3%	4.0%	5.2%	4.2%	5.8%	10.0%	6.7%	4.6%	12.2%	10.5%	5.4%
Engineering, architectural, and surveying	871	375	1.2	2.5	4.7	6.2	11.2	7.8	26.4	3.6	15.5	31.1	3.0
Research, development, and testing	873	215	65.9	7.9	8.0	5.3	5.9	10.4	6.9	8.8	14.9	8.6	5.6
Other engineering and management services	872,874	9	14.3	21.4	73.4	82.4	83.8	0.0	0.0	0.0	35.5	0.0	87.4
Other services	701,72,75–79, 81,83,84,89	41	5.7	10.1	17.0	5.6	5.7	0.0	38.1	0.3	0.0	27.6	3.9
Other nonmanufacturing industries	07–12,14,15, 161–162,17	40	24.5	38.2	25.6	20.2	20.8	0.9	4.0	0.0	17.5	38.3	14.4
Distribution by size of company: [Number of employees]													
Total		4,654	2.0	1.7	1.4	0.6	0.6	0.5	2.3	1.0	3.6	1.7	0.7
Fewer than 500		2,442	9.6	6.9	6.7	4.4	4.6	15.7	17.5	12.3	8.5	8.4	5.8
500 to 999		663	11.3	15.8	3.5	2.8	2.9	4.3	9.0	5.2	29.6	5.2	2.1
1,000 to 4,999		1,008	3.3	3.7	1.1	0.8	0.8	0.2	2.0	0.2	2.7	2.1	1.0
5,000 to 9,999		220	11.5	9.9	1.5	0.8	0.9	0.0	4.0	0.0	10.2	0.2	1.2
10,000 to 24,999		171	0.7	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25,000 or more		128	0.3	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0

NOTE: A description of the standard error of estimate is given in section A under "Survey Methodology." The percentage (or relative) standard errors in this table may be converted to standard errors of estimate by multiplying the percentages shown by the associated estimates. For example, the relative standard error of estimate for R&D performance for all company size groups in the fabricated metal products industry (SIC 34) is shown as 2.9 percent, and the associated total R&D estimate for this industry is shown as $1,023 million in table A-3, "Total (company and Federal) funds for industrial R&D performance by industry and size of company: 1985–95." The standard error of estimate, then, is 0.029 times 1,023 or 30.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

Table B-24. Relative standard error of estimate (percentage) for selected items, by industry, and size of company, 1996

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Industry and size of company	SIC code	Number of R&D-performing companies	Domestic net sales of R&D performers	Domestic employment of R&D performers	Number of FTE scientists and engineers	Total R&D	Company and other funds for R&D	Company-financed R&D performed outside of U.S.	Company-financed R&D contracted to outside organizations	Federal funds for R&D	Total funds for basic research	Total funds for applied research	Total funds for development
			[Percent]										
All Industries		3,969	1.9%	1.9%	1.1%	0.7%	0.7%	1.2%	1.0%	1.6%	2.7%	2.3%	0.7%
Distribution by industry:													
Manufacturing		2,277	1.1	2.2	1.0	0.6	0.6	0.9	0.8	1.5	2.7	2.4	0.6
Food, kindred, and tobacco products	20,21	103	5.6	10.6	12.9	4.2	4.2	0.1	4.2	0.0	12.4	14.1	1.9
Textiles and apparel	22,23	98	4.6	6.3	4.2	4.9	4.9	4.4	3.5	0.0	12.8	18.8	7.3
Lumber, wood products, and furniture	24,25	88	5.5	6.4	5.4	1.3	1.3	0.0	0.1	0.0	2.2	2.3	2.1
Paper and allied products	26	52	6.0	6.8	6.4	5.9	6.1	16.1	10.7	0.0	3.3	6.0	13.1
Chemicals and allied products	28	196	1.7	1.9	1.5	0.7	0.7	0.5	0.4	0.0	1.0	1.3	0.9
Industrial chemicals	281–82,286	64	3.4	3.3	3.7	2.1	2.3	1.7	2.3	0.0	1.5	4.4	2.5
Drugs and medicines	283	51	0.9	1.4	0.5	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Other chemicals	284–85, 287–89	81	3.3	4.4	3.5	1.6	1.6	0.6	4.3	0.0	13.3	1.5	1.8
Petroleum refining and extraction	13,29	22	5.7	6.5	1.9	1.6	1.2	0.0	0.0	72.0	25.3	2.0	1.6
Rubber products	30	163	4.9	4.0	4.8	2.6	2.8	0.6	5.3	0.0	18.2	8.3	2.7
Stone, clay, and glass products	32	57	6.0	7.5	5.6	1.3	1.3	0.0	2.2	0.0	1.5	3.7	0.6
Primary metals	33	74	3.2	6.0	3.7	1.6	2.4	0.0	35.1	0.1	2.4	1.6	6.6
Ferrous metals and products	331–32, 3398–99	36	4.6	10.0	12.4	6.4	6.5	0.0	0.0	0.0	10.6	2.1	11.7
Nonferrous metals and products	333–36	38	4.3	6.5	1.6	0.9	1.5	0.1	48.3	0.1	0.3	2.4	5.5
Fabricated metal products	34	185	4.8	5.8	6.4	2.7	2.8	0.4	49.5	0.0	8.3	4.2	5.5
Machinery	35	338	1.9	9.7	1.8	1.3	1.4	1.1	1.0	1.5	16.1	3.2	1.6
Office, computing, and accounting machines	357	58	0.8	2.0	1.8	1.5	1.5	0.7	0.0	0.0	0.0	0.5	2.1
Other machinery, except electrical	351–56, 358–59	280	2.8	12.2	3.3	2.4	2.5	2.7	3.0	2.7	20.1	10.2	2.4

See explanatory information and SOURCE at end of table.

Table B-2. Relative standard error of estimate percentage for selected items, by industry and size of company, 1996

Industry and size of company	SIC code	Number of R&D-performing companies	Domestic net sales of R&D performers	Domestic employment of R&D performers	Number of FTE scientists and engineers	Total R&D	Company and other funds for R&D	Company-financed R&D performed outside of U.S.	Company-financed R&D contracted to outside organizations	Federal funds for R&D	Total funds for basic research	Total funds for applied research	Total funds for development
			[Percent]										
Distribution by industry:													
Electrical equipment	36	375	1.3%	2.5%	1.8%	1.7%	1.9%	6.7%	14.9%	1.9%	11.9%	5.5%	2.9%
Radio and TV receiving equipment	365	24	2.9	15.3	1.7	2.5	2.5	4.4	0.0	0.0	0.0	2.2	3.4
Communication equipment	366	99	2.6	3.7	2.6	2.9	3.3	0.2	14.4	0.4	16.0	8.5	3.0
Electronic components	367	116	2.3	5.3	2.3	2.0	2.1	1.9	28.3	3.1	10.5	7.9	3.5
Other electrical equipment	361–64,369	136	2.0	2.8	6.6	6.3	7.0	24.5	13.9	0.4	22.9	4.7	8.4
Transportation equipment	37	72	0.9	7.4	0.5	0.3	0.4	0.0	0.0	0.3	4.1	1.6	0.0
Motor vehicles and motor vehicles equipment	371	32	1.0	4.0	0.5	0.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Other transportation equipment	373–75,379	16	9.2	48.9	17.2	7.1	1.6	0.0	0.0	15.0	0.3	45.9	2.6
Aircraft and missiles	372,376	24	0.6	0.8	0.4	0.2	0.7	0.0	0.0	0.0	4.8	0.0	0.0
Professional and scientific instruments	38	248	1.6	2.0	1.9	1.1	1.6	1.3	10.4	0.2	4.2	6.7	1.1
Scientific and mechanical measuring instruments	381–82	126	2.3	2.8	2.6	1.7	3.6	6.2	17.2	0.2	6.8	18.1	1.8
Optical, surgical, photographic, and other instruments	384–87	122	2.3	2.8	2.5	1.2	1.2	0.5	11.9	1.0	5.4	2.5	1.3
Other manufacturing industries 1/	27,31,39	206	6.2	6.9	14.4	15.6	12.9	2.3	24.8	55.0	36.3	35.6	15.7
Nonmanufacturing		1,692	5.3	3.6	2.9	2.2	2.3	5.6	3.3	6.7	6.1	5.1	2.2
Transportation and utilities	40–42,44–49	124	1.1	1.0	1.2	2.4	2.5	0.0	0.5	0.0	0.2	0.3	3.2
Communications	48	24	1.4	0.3	1.4	0.5	0.5	0.0	0.4	0.0	0.0	0.0	0.7
Telephone communications	481	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other communications	482–484,489	13	51.4	25.2	43.9	28.4	28.4	0.0	46.9	0.0	0.0	0.0	37.8

See explanatory information and SOURCE at end of table.

Table B-2a. Relative standard error of estimate (percentage) for selected items, by industry and size of company, 1996

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Industry and size of company	SIC code	Number of R&D-performing companies	Domestic net sales of R&D performers	Domestic employment of R&D performers	Number of FTE scientists and engineers	Total R&D	Company and other funds for R&D	Company-financed R&D performed outside of U.S.	Company-financed R&D contracted to outside organizations	Federal funds for R&D	Total funds for basic research	Total funds for applied research	Total funds for development
			[Percent]										
Distribution by industry:													
Electric, gas, and sanitary services	49	85	0.7%	0.6%	1.8%	2.8%	3.1%	0.0%	0.8%	0.0%	0.2%	2.9%	4.1%
Other transportation and utilities	40–42,44–47	15	6.0	3.2	6.5	49.2	52.0	0.0	23.8	0.0	40.0	58.5	65.1
Trade	50–59	161	9.7	11.4	9.2	8.0	8.1	34.3	6.6	9.7	27.6	15.0	7.8
Finance, insurance, and real estate	60–65,67	45	20.1	14.4	17.5	14.0	14.1	0.0	0.3	0.0	38.7	53.5	12.3
Services	701,72,73, 75–81,83, 84,87,89	1,274	9.0	5.3	2.8	1.3	1.4	0.8	6.8	3.2	5.2	2.3	1.4
Business services	73	569	3.3	2.8	2.0	1.8	1.7	2.0	11.5	15.6	10.7	3.5	1.8
Computer and data processing services	737	523	4.1	6.4	2.0	1.8	1.7	1.9	11.5	16.2	9.1	3.6	1.9
Other business services	731–736,738	46	4.3	2.2	23.0	16.7	17.7	86.8	21.9	0.0	91.6	5.1	13.9
Health services	80	34	7.7	8.5	39.5	2.7	2.7	0.0	8.9	8.9	13.3	1.8	3.7
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	26	8.1	10.2	41.2	2.7	2.7	0.0	9.7	12.6	13.5	1.9	3.8
Other health services	802–805, 808–809	8	8.3	8.0	0.2	8.9	9.4	0.0	0.0	0.0	68.5	0.0	0.1
Engineering and management services	87	641	18.5	18.4	2.6	2.1	2.7	3.7	9.9	3.0	6.0	3.4	2.6
Engineering, architectural, and surveying	871	261	1.7	2.1	3.9	5.9	9.3	3.0	6.3	6.6	12.6	12.7	6.0
Research, development, and testing	873	356	34.5	30.0	2.1	1.9	2.6	4.3	10.5	2.0	5.1	2.2	2.5

See explanatory information and SOURCE at end of table.

Table B-2a. Relative standard error of estimate (percentage) for selected items, by industry and size of company: 1996

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Industry and size of company	SIC code	Number of R&D-performing companies	Domestic net sales of R&D performers	Domestic employment of R&D performers	Number of FTE scientists and engineers	Total R&D	Company and other funds for R&D	Company-financed R&D performed outside of U.S.	Company-financed R&D contracted to outside organizations	Federal funds for R&D	Total funds for basic research	Total funds for applied research	Total funds for development
								[Percent]					
Distribution by industry:													
Other engineering and management services	872,874	24	37.8%	33.3%	32.9%	33.3%	33.9%	0.0%	0.0%	83.8%	66.7%	50.2%	43.2%
Other services	701,72,75–79, 81, 83,84,89	30	35.2	28.9	49.5	6.6	6.8	0.0	20.1	0.0	12.9	1.2	8.4
Other nonmanufacturing industries 1/	07–12,14,15, 161–162,17	88	20.0	7.5	22.0	28.1	28.9	0.0	58.3	80.4	28.2	47.1	29.1
Distribution by size of company: [Number of employees]													
Total		3,969	1.9	1.9	1.1	0.7	0.7	1.2	1.0	1.6	2.7	2.3	0.7
Fewer than 500		2,032	6.5	4.6	4.9	4.7	4.8	28.9	8.5	16.4	8.8	10.2	5.2
500 to 999		497	10.9	10.4	3.8	3.0	3.2	19.7	3.0	5.3	6.7	5.6	2.7
1,000 to 4,999		909	6.8	7.2	1.7	1.2	1.1	3.9	1.0	10.4	2.9	2.7	1.1
5,000 to 9,999		243	1.2	8.5	0.7	0.4	0.1	0.6	0.2	8.5	2.3	1.9	0.1
10,000 to 24,999		167	2.7	2.6	0.3	0.1	0.1	0.0	0.1	0.0	0.2	0.1	0.0
25,000 or more		121	2.9	2.1	0.7	0.2	0.2	0.0	0.0	0.0	0.4	0.2	0.3

1/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not comparable with statistics for prior years.

NOTE: A description of the standard error of estimate is given in section A under "Methodology of Survey." The percentage (or relative) standard errors in this table may be converted to standard errors of estimate by multiplying the percentages shown by the associated estimates. For example, the relative standard error of estimate for R&D performance for all company size groups in the chemicals and allied products industry (SIC 28) is shown as 0.7 percent, and the associated total R&D estimate for this industry is shown as $18,024 million in table A-3, "Total (company and Federal) funds for industrial R&D performance by industry and size of company: 1986–96." The standard error of estimate, then, is 0.007 times 18,024 or 126.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

ultimately report R&D expenditures vastly larger than their assigned values can have adverse effects on the statistics, which are based on the weighted value of survey responses. To lessen the effects on the final statistics, the maximum weight of a company was controlled by specifying a minimum probability that could be assigned to the company. If the probability, based on company size, was less than the minimum probability, then it was reset to this minimum value. The consequence of raising these original probabilities to the minimum probability was to raise the expected sample size. Similarly, a maximum weight for each stratum was established for SRS of the small partition. If the sample size initially allocated to a stratum resulted in a stratum weight above this maximum value, then the sample size was increased until the maximum weight was achieved. It is likely that most of the difference between the size of the target sample and the sample actually selected was because of the minimum probability rule.

Third, between the time that the frame was created and the survey was prepared for mailing, the operational status of some companies changed. That is, they were merged with or acquired by another company, or they were no longer in business. Before preparing the survey for mailing, the operational status was updated to identify these changes. As a result, the number of companies mailed a survey form was somewhat smaller than the number of companies initially selected for the survey.

And finally, for 1995, a minimum sample size was established for each stratum of the small company partition. If the proportionately allocated sample size fell below the minimum value for a given stratum, then the sample size was set equal to this value. For 1996, the definition for the small company strata was changed (discussed under "Frame Creation" above) and collapsed to the manufacturing and nonmanufacturing levels. Separate samples were selected for both of these small company strata. Because only two samples were drawn from these strata, compared with the 25+ that were drawn for the 1995 sample, the minimum sample size constraint was not necessary for 1996.

WEIGHTING AND MAXIMUM WEIGHTS

Weights were applied to each company record to produce national estimates for both 1995 and 1996. Within the PPS partitions of the samples, company records were given weights up to a maximum of 50; for companies within the SRS partitions of the samples, company records were given weights up to a maximum of 300.

SURVEY QUESTIONNAIRES

Two questionnaires are used each year to collect data for the survey. For large firms known to perform R&D, a detailed questionnaire, form RD-1L, is used to collect data for odd-numbered years and an abbreviated version, form RD-1S, is used to collect data for even-numbered years. The questionnaires are cycled in this manner to reduce reporting burden on survey respondents.

Form RD-1L requests data on sales or receipts, total employment, employment of scientists and engineers, expenditures for R&D performed within the company with Federal funds and with company and other funds, character of work (basic research, applied research, and development), company-sponsored R&D expenditures in foreign countries, R&D performed under contract by others, expenditures for pollution abatement and energy R&D, detail on R&D by product field, Federal R&D support to the firm by contracting agency, domestic R&D expenditures by State, and foreign R&D by country. Form RD-1S requests the same information except for the last four items. Because companies receiving forms RD-1L and RD-1S generally have participated in previous surveys, computer imprinted data reported by the company for the previous year are supplied for reference.

To further limit reporting burden on small R&D performers and on firms that are included in the sample for the first time, an even more abbreviated form is used each year. Form RD-1A collects data only on R&D, sales, employment, and operational status and includes a screening item that allows respondents to indicate that they do not perform R&D before completing the questionnaires. No prior-year information is available since the majority of the companies have not reported previously.

Beginning in 1996, the collection of data on R&D performed under contract by others was expanded. Previously, data were collected only on nonfederally funded R&D performed under contract by others. In 1996, data on federally funded and total R&D contracted-out were collected to better measure the amount of R&D performed both within and between companies.

For the 1995 survey, about 2,700 companies that reported $1 million or more in R&D spending in the 1994 survey received form RD-1S and nearly 20,800 received form RD-1A. Of the 23,500 firms, approximately 4,800 reported R&D expenditures. For the 1996 survey, about 2,600 companies that reported $1 million or more in R&D spending in the 1995 survey received form RD-1S and over 22,300 received form RD-1A. Of the 24,900 firms, approximately 4,000 reported R&D expenditures. Both questionnaires and their accompanying instructions are reproduced in section C, Survey Documents.

FOLLOW-UP FOR SURVEY NONRESPONSE

The 1995 and 1996 survey questionnaires were mailed in March 1996 and April 1997, respectively, and recipients were asked to respond within 60 days. Thirty days later, letters were mailed to all survey recipients reminding them that their completed questionnaire was due within the next 30 days. After 60 days, follow-up letters were sent to all firms that did not respond. Three additional follow-up mailings were made to persistent nonrespondents, after 90, 120, and 150 days.

In addition to the mailings, telephone follow-up was used to encourage response from those firms ranked among the 300 largest R&D performers, based on total R&D expenditures reported in the previous survey. Tables B-3 and B-3a show the number of companies in each industry or industry group that received a questionnaire and the percentage of companies that responded to the survey.

IMPUTATION FOR ITEM NONRESPONSE

For various reasons, many firms chose to return the survey questionnaires with one or more blank items.[5] For instance, the internal accounting procedures of the firm may not have allowed it to quantify the character-of-work distribution of R&D (i.e., basic research, applied research, and development). In addition, some firms, as a matter of policy, refused to answer any voluntary questions.[6]

When respondents did not provide the requested information, estimates for the missing data were made using imputation algorithms. In general, the imputation algorithms computed values for missing items by applying the average percentage change for the target item in the nonresponding firm's industry to the item's prior-year value for that firm, reported or imputed. This approach, with minor variation, was used for most items.[7] Tables B-4 and B-4a contain imputation rates for the principal survey items.

RESPONSE RATES AND MANDATORY VERSUS VOLUNTARY REPORTING

Current survey reporting requirements divide survey items into two groups: mandatory and voluntary. Response to four data items on the questionnaires—total R&D expenditures, Federal R&D funds, net sales, and total employment—is mandatory; response to the remaining items is voluntary. During the 1990 survey cycle, NSF conducted a test of the effect of reporting on a completely voluntary basis to determine if combining both mandatory and voluntary items on one questionnaire influences response rates. For this test, the 1990 sample was divided into two panels of approximately equal size. One panel, the mandatory panel, was asked to report as usual, four mandatory items and the remainder voluntary, and the other panel was asked to report all items on a completely voluntary basis. The result of the test was a decrease in the overall survey response rate to 80 percent from levels of 88 percent in 1989 and 89 percent in 1988. The response rates for the mandatory and voluntary panels were 89 percent and 69 percent, respectively. Detailed results of the test were published in *Research and Development in Industry: 1990*. For firms that reported R&D expenditures in 1995 and 1996, tables B-5 and B-5a show the percentage that also reported data for other selected items.

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[5] For detailed discussions on the sources, control, and measurement of error resulting from item nonresponse, see the technical report: U.S. Department of Commerce, Bureau of the Census, *Documentation of Nonsampling Error Issues in the Survey of Industrial Research and Development*, RR94/03 (Washington, DC, Sept. 21, 1994). For a general discussion of the problems stemming from item nonresponse, see the technical report: National Science Foundation, *Estimating Basic and Applied Research and Development in Industry: A Preliminary Review of Survey Procedures*, NSF 90-322 (Washington, DC, 1990).

[6] All but four items—total R&D, Federal R&D, net sales, and total employment, which are included in the Census Bureau's annual mandatory statistical program—are voluntary. See further discussion under Response Rates and Mandatory Versus Voluntary Reporting, later in this section.

[7] For detailed descriptions and analyses of the imputation methods and algorithms used, see the technical report: U.S. Department of Commerce, Bureau of the Census, *An Evaluation of Imputation Methods for the Survey of Industrial Research and Development*, ESMD-9404 (Washington, DC, Sept. 1994).

Table B-1. Unit response rates—percentage of companies that responded to survey, by industry: 1995

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Industry	SIC code	Number of companies that received questionnaire	Response rate
All Industries		23,697	85.2%
Manufacturing		7,578	85.4
Food, kindred, and tobacco products	20,21	236	84.3
Textiles and apparel	22,23	220	81.8
Lumber, wood products, and furniture	24,25	299	84.9
Paper and allied products	26	225	87.6
Chemicals and allied products	28	424	86.8
Industrial chemicals	281–82,286	132	90.9
Drugs and medicines	283	120	83.3
Other chemicals	284–85,287–89	172	86.0
Petroleum refining and extraction	13,29	96	92.7
Rubber products	30	543	83.2
Stone, clay, and glass products	32	378	92.1
Primary metals	33	288	84.7
Ferrous metals and products	331–32,3398–99	105	84.8
Nonferrous metals and products	333–36	183	84.7
Fabricated metal products	34	762	85.2
Machinery	35	780	86.7
Office, computing, and accounting machines	357	135	81.5
Other machinery, except electrical	351–56,358–59	645	87.8
Electrical equipment	36	840	81.7
Radio and TV receiving equipment	365	75	81.3
Communication equipment	366	179	79.3
Electronic components	367	325	82.2
Other electrical equipment	361–64,369	261	82.8
Transportation equipment	37	278	86.7
Motor vehicles and motor vehicles equipment	371	159	92.5
Other transportation equipment	373–75,379	45	77.8
Aircraft and missiles	372,376	74	79.7
Professional and scientific instruments	38	422	85.5
Scientific and mechanical measuring instruments	381–82	211	87.2
Optical, surgical, photographic, and other instruments	384–87	211	83.9
Other manufacturing industries	27,31,39	1,751	86.3

See explanatory information and SOURCE at end of table.

[illegible] percentage of companies that responded to survey, by industry: [illegible]

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Industry	SIC code	Number of companies that received questionnaire	Response rate
Nonmanufacturing		16,119	85.1%
Transportation and utilities	40–42,44–49	1,060	83.7
Communications	48	552	84.8
Telephone communications	481	104	84.6
Other communications	482–484,489	448	84.8
Electric, gas, and sanitary services	49	194	89.2
Other transportation and utilities	40–42,44–47	314	78.3
Trade	50–59	2,554	80.8
Finance, insurance, and real estate	60–65,67	1,770	87.4
Services	701,72,73,75–81, 83,84,87,89	9,830	86.2
Business services	73	2,146	81.8
Computer and data processing services	737	1,088	78.4
Other business services	731–736,738	1,058	85.3
Health services	80	1,325	86.8
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	586	87.2
Other health services	802–805,808–809	739	86.5
Engineering and management services	87	4,891	88.2
Engineering, architectural, and surveying	871	4,168	88.6
Research, development, and testing	873	483	85.1
Other engineering and management services	872,874	240	88.3
Other services	701,72,75–79,81, 83,84,89	1,468	85.1
Other nonmanufacturing industries	07–12,14,15, 161–162,17	905	82.4

See explanatory information and SOURCE at end of table.

[illegible] companies that responded to survey, by industry, [illegible]

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Industry	SIC code	Number of companies that received questionnaire	Response rate
All companies receiving form RD-1L			
All Industries		2,747	87.4%
Manufacturing		2,064	87.6
Food, kindred, and tobacco products	20,21	85	89.4
Textiles and apparel	22,23	55	87.3
Lumber, wood products, and furniture	24,25	30	86.7
Paper and allied products	26	58	91.4
Chemicals and allied products	28	244	90.2
Industrial chemicals	281–82,286	83	92.8
Drugs and medicines	283	80	86.3
Other chemicals	284–85,287–89	81	91.4
Petroleum refining and extraction	13,29	31	90.3
Rubber products	30	91	86.8
Stone, clay, and glass products	32	33	93.9
Primary metals	33	66	89.4
Ferrous metals and products	331–32,3398–99	34	91.2
Nonferrous metals and products	333–36	32	87.5
Fabricated metal products	34	121	86.8
Machinery	35	367	86.9
Office, computing, and accounting machines	357	109	82.6
Other machinery, except electrical	351–56,358–59	258	88.8
Electrical equipment	36	394	84.5
Radio and TV receiving equipment	365	14	85.7
Communication equipment	366	116	84.5
Electronic components	367	142	86.6
Other electrical equipment	361–64,369	122	82.0
Transportation equipment	37	96	91.7
Motor vehicles and motor vehicles equipment	371	48	97.9
Other transportation equipment	373–75,379	20	80.0
Aircraft and missiles	372,376	28	89.3
Professional and scientific instruments	38	307	87.6
Scientific and mechanical measuring instruments	381–82	156	89.1
Optical, surgical, photographic, and other instruments	384–87	151	86.1
Other manufacturing industries	27,31,39	86	87.2

See explanatory information and SOURCE at end of table.

[illegible]

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Industry	SIC code	Number of companies that received questionnaire	Response rate
Nonmanufacturing		683	86.5%
Transportation and utilities	40–42,44–49	84	86.9
Communications	48	21	85.7
Telephone communications	481	14	92.9
Other communications	482–484,489	7	71.4
Electric, gas, and sanitary services	49	48	89.6
Other transportation and utilities	40–42,44–47	15	80.0
Trade	50–59	158	90.5
Finance, insurance, and real estate	60–65,67	36	94.4
Services	701,72,73,75–81, 83,84,87,89	377	83.6
Business services	73	170	80.6
Computer and data processing services	737	156	80.1
Other business services	731–736,738	14	85.7
Health services	80	23	91.3
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	18	100.0
Other health services	802–805,808–809	5	60.0
Engineering and management services	87	163	84.7
Engineering, architectural, and surveying	871	37	83.8
Research, development, and testing	873	117	86.3
Other engineering and management services	872,874	9	66.7
Other services	701,72,75–79,81, 83,84,89	21	90.5
Other nonmanufacturing industries	07–12,14,15, 161–162,17	28	92.9

See explanatory information and SOURCE at end of table.

[illegible] that responded [illegible]

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Industry	SIC code	Number of companies that received questionnaire	Response rate
All companies receiving form RD-1A			
All industries		20,950	84.9%
Manufacturing		5,514	84.6
Food, kindred, and tobacco products	20,21	151	81.5
Textiles and apparel	22,23	165	80.0
Lumber, wood products, and furniture	24,25	269	84.8
Paper and allied products	26	167	86.2
Chemicals and allied products	28	180	92.2
Industrial chemicals	281–82,286	49	87.8
Drugs and medicines	283	40	77.5
Other chemicals	284–85,287–89	91	81.3
Petroleum refining and extraction	13,29	65	93.8
Rubber products	30	452	82.5
Stone, clay, and glass products	32	345	91.9
Primary metals	33	222	83.3
Ferrous metals and products	331–32,3398–99	71	81.7
Nonferrous metals and products	333–36	151	84.1
Fabricated metal products	34	641	84.9
Machinery	35	413	86.4
Office, computing, and accounting machines	357	26	76.9
Other machinery, except electrical	351–56,358–59	387	87.1
Electrical equipment	36	446	79.1
Radio and TV receiving equipment	365	61	80.3
Communication equipment	366	63	69.8
Electronic components	367	183	78.7
Other electrical equipment	361–64,369	139	83.5
Transportation equipment	37	182	84.1
Motor vehicles and motor vehicles equipment	371	111	90.1
Other transportation equipment	373–75,379	25	76.0
Aircraft and missiles	372,376	46	73.9
Professional and scientific instruments	38	115	80.0
Scientific and mechanical measuring instruments	381–82	55	81.8
Optical, surgical, photographic, and other instruments	384–87	60	78.3
Other manufacturing industries	27,31,39	1,665	86.2

See explanatory information and SOURCE at end of table.

[illegible]

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Industry	SIC code	Number of companies that received questionnaire	Response rate
Nonmanufacturing		15,436	85.0%
Transportation and utilities	40–42,44–49	976	83.4
Communications	48	531	84.7
Telephone communications	481	90	83.3
Other communications	482–484,489	441	85.0
Electric, gas, and sanitary services	49	146	89.0
Other transportation and utilities	40–42,44–47	299	78.3
Trade	50–59	2,396	80.2
Finance, insurance, and real estate	60–65,67	1,734	87.3
Services	701,72,73,75–81, 83,84,87,89	9,453	86.3
Business services	73	1,976	81.9
Computer and data processing services	737	932	78.1
Other business services	731–736,738	1,044	85.3
Health services	80	1,302	86.7
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	568	86.8
Other health services	802–805,808–809	734	86.6
Engineering and management services	87	4,728	88.3
Engineering, architectural, and surveying	871	4,131	88.6
Research, development, and testing	873	366	84.7
Other engineering and management services	872,874	231	89.2
Other services	701,72,75–79,81, 83,84,89	1,447	85.1
Other nonmanufacturing industries	07–12,14,15, 161–162,17	877	82.1

NOTE: The calculation of the response rate was based on all companies that responded to the survey, including those that reported they were out of scope, out of business, or had merged with another company. It excludes companies for which total R&D expenditure data were imputed.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible] companies that responded to survey, by industry: 1996

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Industry	SIC code	Number of companies that received questionnaire	Response rate
All industries		24,819	83.9%
Manufacturing		4,744	85.4
Food, kindred, and tobacco products	20,21	181	85.1
Textiles and apparel	22,23	246	85.4
Lumber, wood products, and furniture	24,25	169	91.7
Paper and allied products	26	74	93.2
Chemicals and allied products	28	220	90.0
Industrial chemicals	281–82,286	71	95.8
Drugs and medicines	283	55	89.1
Other chemicals	284–85,287–89	94	86.2
Petroleum refining and extraction	13,29	62	90.3
Rubber products	30	253	85.4
Stone, clay, and glass products	32	90	93.3
Primary metals	33	105	89.5
Ferrous metals and products	331–32,3398–99	48	93.8
Nonferrous metals and products	333–36	57	86.0
Fabricated metal products	34	306	86.6
Machinery	35	453	85.2
Office, computing, and accounting machines	357	65	83.1
Other machinery, except electrical	351–56,358–59	388	85.6
Electrical equipment	36	476	83.2
Radio and TV receiving equipment	365	34	82.4
Communication equipment	366	112	75.0
Electronic components	367	140	87.1
Other electrical equipment	361–64,369	190	85.3
Transportation equipment	37	95	89.5
Motor vehicles and motor vehicles equipment	371	44	90.9
Other transportation equipment	373–75,379	24	87.5
Aircraft and missiles	372,376	27	88.9
Professional and scientific instruments	38	300	81.3
Scientific and mechanical measuring instruments	381–82	143	82.5
Optical, surgical, photographic, and other instruments	384–87	157	80.3
Other manufacturing industries 1/	27,31,39	1,714	81.9

See explanatory information and SOURCE at end of table.

[illegible]

Industry	SIC code	Number of companies that received questionnaire	Response rate
Nonmanufacturing		20,075	83.6%
Transportation and utilities	40–42,44–49	894	84.1
Communications	48	174	80.5
Telephone communications	481	34	76.5
Other communications	482–484,489	140	81.4
Electric, gas, and sanitary services	49	249	88.4
Other transportation and utilities	40–42,44–47	471	83.2
Trade	50–59	5,043	82.1
Finance, insurance, and real estate	60–65,67	844	88.7
Services	701,72,73,75–81, 83,84,87,89	7,047	84.8
Business services	73	2,144	82.0
Computer and data processing services	737	1,168	80.2
Other business services	731–736,738	976	84.2
Health services	80	962	87.2
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	564	87.6
Other health services	802–805,808–809	398	86.7
Engineering and management services	87	2,632	86.6
Engineering, architectural, and surveying	871	1,223	87.2
Research, development, and testing	873	851	85.2
Other engineering and management services	872,874	558	87.6
Other services	701,72,75–79,81, 83,84,89	1,309	83.7
Other nonmanufacturing industries 1/	07–12,14,15, 161–162,17	6,247	82.8

See explanatory information and SOURCE at end of table.

[illegible] rates: percentage of companies that responded to survey, by industry: 1996

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Industry	SIC code	Number of companies that received questionnaire	Response rate
All companies receiving form RD-1S			
All Industries		2,522	86.6%
Manufacturing		1,638	87.4
Food, kindred, and tobacco products	20,21	76	90.8
Textiles and apparel	22,23	54	87.0
Lumber, wood products, and furniture	24,25	32	93.8
Paper and allied products	26	47	91.5
Chemicals and allied products	28	177	91.0
Industrial chemicals	281–82,286	60	96.7
Drugs and medicines	283	53	90.6
Other chemicals	284–85,287–89	64	85.9
Petroleum refining and extraction	13,29	20	95.0
Rubber products	30	100	89.0
Stone, clay, and glass products	32	40	92.5
Primary metals	33	62	90.3
Ferrous metals and products	331–32,3398–99	26	92.3
Nonferrous metals and products	333–36	36	88.9
Fabricated metal products	34	122	87.7
Machinery	35	280	86.1
Office, computing, and accounting machines	357	59	86.4
Other machinery, except electrical	351–56,358–59	221	86.0
Electrical equipment	36	303	84.2
Radio and TV receiving equipment	365	16	93.8
Communication equipment	366	84	76.2
Electronic components	367	107	87.9
Other electrical equipment	361–64,369	96	85.4
Transportation equipment	37	66	89.4
Motor vehicles and motor vehicles equipment	371	28	92.9
Other transportation equipment	373–75,379	15	86.7
Aircraft and missiles	372,376	23	87.0
Professional and scientific instruments	38	183	83.6
Scientific and mechanical measuring instruments	381–82	92	81.5
Optical, surgical, photographic, and other instruments	384–87	91	85.7
Other manufacturing industries 1/	27,31,39	76	86.8

See explanatory information and SOURCE at end of table.

Table B-5a. Unit response rates -- percentage of companies that responded to survey, by industry: 1996

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Industry	SIC code	Number of companies that received questionnaire	Response rate
Nonmanufacturing		884	85.2%
Transportation and utilities	40–42,44–49	77	84.4
Communications	48	17	88.2
Telephone communications	481	11	100.0
Other communications	482–484,489	6	66.7
Electric, gas, and sanitary services	49	46	84.8
Other transportation and utilities	40–42,44–47	14	78.6
Trade	50–59	105	81.9
Finance, insurance, and real estate	60–65,67	29	86.2
Services	701,72,73,75–81, 83,84,87,89	641	85.6
Business services	73	294	85.4
Computer and data processing services	737	277	85.2
Other business services	731–736,738	17	88.2
Health services	80	18	77.8
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	15	73.3
Other health services	802–805,808–809	3	100.0
Engineering and management services	87	310	85.5
Engineering, architectural, and surveying	871	137	82.5
Research, development, and testing	873	167	88.6
Other engineering and management services	872,874	6	66.7
Other services	701,72,75–79,81, 83,84,89	19	100.0
Other nonmanufacturing industries 1/	07–12,14,15, 161–162,17	32	87.5

See explanatory information and SOURCE at end of table.

Table B-3a. Unit response rates—percentage of companies that responded to survey, by industry: 1996

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Industry	SIC code	Number of companies that received questionnaire	Response rate
All companies receiving form RD-1A			
All Industries		22,332	83.5%
Manufacturing		3,108	84.2
Food, kindred, and tobacco products	20,21	105	81.0
Textiles and apparel	22,23	192	84.9
Lumber, wood products, and furniture	24,25	137	91.2
Paper and allied products	26	27	96.3
Chemicals and allied products	28	43	86.0
Industrial chemicals	281–82,286	11	90.9
Drugs and medicines	283	2	50.0
Other chemicals	284–85,287–89	30	86.7
Petroleum refining and extraction	13,29	42	88.1
Rubber products	30	153	83.0
Stone, clay, and glass products	32	50	94.0
Primary metals	33	43	88.4
Ferrous metals and products	331–32,3398–99	22	95.5
Nonferrous metals and products	333–36	21	81.0
Fabricated metal products	34	184	85.9
Machinery	35	174	83.3
Office, computing, and accounting machines	357	6	50.0
Other machinery, except electrical	351–56,358–59	168	84.5
Electrical equipment	36	173	81.5
Radio and TV receiving equipment	365	18	72.2
Communication equipment	366	28	71.4
Electronic components	367	33	84.8
Other electrical equipment	361–64,369	94	85.1
Transportation equipment	37	29	89.7
Motor vehicles and motor vehicles equipment	371	16	87.5
Other transportation equipment	373–75,379	9	88.9
Aircraft and missiles	372,376	4	100.0
Professional and scientific instruments	38	118	77.1
Scientific and mechanical measuring instruments	381–82	52	82.7
Optical, surgical, photographic, and other instruments	384–87	66	72.7
Other manufacturing industries 1/	27,31,39	1,638	81.6

See explanatory information and SOURCE at end of table.

Table B-33. Unit response rates—percentage of companies that responded to survey, by industry: 1996

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Industry	SIC code	Number of companies that received questionnaire	Response rate
Nonmanufacturing		19,224	83.4%
Transportation and utilities	40–42,44–49	824	83.4
Communications	48	163	76.7
Telephone communications	481	23	65.2
Other communications	482–484,489	140	78.6
Electric, gas, and sanitary services	49	203	89.2
Other transportation and utilities	40–42,44–47	458	83.2
Trade	50–59	4,938	82.1
Finance, insurance, and real estate	60–65,67	815	88.8
Services	701,72,73,75–81, 83,84,87,89	6,432	84.3
Business services	73	1,864	80.9
Computer and data processing services	737	893	78.5
Other business services	731–736,738	971	83.1
Health services	80	956	86.3
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	552	87.5
Other health services	802–805,808–809	404	84.7
Engineering and management services	87	2,322	86.8
Engineering, architectural, and surveying	871	1,086	87.8
Research, development, and testing	873	684	84.4
Other engineering and management services	872,874	552	87.9
Other services	701,72,75–79,81, 83,84,89	1,290	83.5
Other nonmanufacturing industries 1/	07–12,14,15, 161–162,17	6,215	82.8

1/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not comparable with statistics for prior years.

NOTES: The calculation of the response rate was based on all companies that responded to the survey, including those that reported they were out of scope, out of business, or had merged with another company. It excludes companies for which total R&D expenditure data were imputed.

The total number of companies is generally less than the number of companies sampled in table B-1 because some companies selected for the survey went out of business or were merged with other companies during the time between survey sampling and survey mailout.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

Table B-4. Imputation rates for selected items, by industry: 1995

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Industry	SIC code	Net sales	Total employment	R&D scientists/ engineers	Total R&D			R&D by cost			R&D by state	Energy R&D	Pollution abatement	R&D outside company	Foreign R&D
					Total	Company	Federal	Wages	Materials	Other costs					
		[Percent]													
All Industries		4.3%	0.5%	35.1%	7.8%	6.5%	16.9%	56.0%	56.2%	58.7%	50.8%	11.1%	25.5%	12.4%	10.1%
Manufacturing		4.4	1.7	40.6	7.6	6.7	14.5	61.1	59.3	62.1	54.7	0.0	4.2	15.2	11.7
Food, kindred, and tobacco products	20,21	2.5	2.7	26.7	3.2	3.2	0.0	38.2	40.4	36.2	31.7	0.0	0.0	2.1	1.3
Textiles and apparel	22,23	7.5	6.0	19.6	12.5	12.5	0.0	71.1	54.2	69.1	65.9	0.0	0.0	0.0	0.0
Lumber, wood products, and furniture	24,25	6.7	5.5	41.7	11.6	10.6	100.0	72.4	71.9	83.8	71.2	0.0	0.0	1.5	76.8
Paper and allied products	26	15.7	18.1	65.8	49.6	48.0	98.7	84.6	82.5	89.4	75.3	0.0	0.0	1.0	82.0
Chemicals and allied products	28	8.0	8.0	26.1	8.1	7.6	50.4	42.1	38.7	45.2	0.0	0.0	0.8	17.2	10.9
Industrial chemicals	281–82,286	5.8	8.5	22.8	5.3	3.5	55.5	39.6	37.0	52.3	56.6	0.0	0.1	0.0	1.7
Drugs and medicines	283	14.6	11.8	26.7	10.6	10.6	9.0	44.4	40.5	45.1	43.5	0.0	0.0	23.4	17.0
Other chemicals	284–85, 287–89	5.5	4.7	30.2	3.4	3.4	0.0	37.0	31.9	29.6	33.8	0.0	23.0	0.2	0.4
Petroleum refining and extraction	13,29	1.4	2.9	33.7	1.4	1.4	0.0	35.0	36.4	35.1	45.6	0.0	0.0	9.7	0.0
Rubber products	30	3.9	3.7	29.7	4.6	4.9	0.0	54.1	51.3	52.7	51.3	0.0	0.0	1.4	1.0
Stone, clay, and glass products	32	0.6	0.4	30.6	1.1	1.0	15.1	41.4	43.8	40.4	40.8	0.0	0.0	0.0	0.0
Primary metals	33	0.9	2.6	38.2	6.7	6.9	0.0	50.3	58.9	43.0	0.0	0.0	0.0	4.7	0.0
Ferrous metals and products	331–32, 3398–99	1.7	2.3	25.8	11.2	11.4	0.0	28.2	39.1	20.4	24.8	0.0	0.0	0.0	0.0
Nonferrous metals and products	333–36	0.7	3.0	46.3	4.0	4.2	0.0	65.1	64.8	62.5	75.4	0.0	0.0	8.4	0.0
Fabricated metal products	34	7.5	7.4	24.9	6.9	4.9	28.4	41.7	40.6	39.3	44.2	0.0	0.0	12.2	0.6
Machinery	35	7.5	11.7	46.1	13.0	13.0	8.2	53.2	49.5	55.1	0.0	0.0	0.3	11.7	11.8
Office, computing, and accounting machines	357	17.0	29.9	45.5	22.4	22.4	24.8	66.4	65.3	67.5	62.2	0.0	0.0	28.1	20.0
Other machinery, except electrical	351–56, 358–59	5.0	8.3	46.5	4.2	4.2	2.3	35.8	40.0	36.9	32.5	0.0	0.3	0.0	9.9

See explanatory information and SOURCE at end of table.

Table B-4. Imputation rates for selected items, by industry: [illegible]

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Industry	SIC code	Net sales	Total employment	R&D scientists/ engineers	Total R&D			R&D by cost			R&D by state	Energy R&D	Pollution abatement	R&D outside company	Foreign R&D
					Total	Company	Federal	Wages	Materials	Other costs					
		[Percent]													
Electrical equipment	36	6.3%	7.1%	48.2%	4.3%	6.3%	1.1%	75.3%	69.3%	72.1%	0.0%	0.0%	0.4%	1.9%	3.5%
Radio and TV receiving equipment	365	10.7	14.5	24.2	9.3	9.5	0.0	80.6	77.6	83.5	74.8	0.0	0.0	0.0	71.7
Communication equipment	366	5.8	9.0	62.8	6.6	7.6	0.3	77.8	77.9	83.5	80.0	0.0	0.0	0.5	1.4
Electronic components	367	9.5	9.1	50.5	3.4	4.3	0.4	84.3	83.9	85.2	55.7	0.0	2.0	2.4	0.2
Other electrical equipment	361–64,369	3.4	4.7	23.4	4.3	10.5	2.7	37.3	32.6	33.2	35.1	0.0	0.0	2.2	7.8
Transportation equipment	37	0.8	1.6	35.6	2.0	0.7	3.8	61.4	60.5	66.2	0.0	0.0	11.2	0.1	0.0
Motor vehicles and motor vehicles equipment	371	0.0	0.2	35.9	0.0	0.0	0.0	37.2	36.1	37.0	35.5	0.0	13.6	0.0	0.0
Other transportation equipment	373–75,379	10.4	9.6	42.0	2.4	5.9	0.0	90.3	94.3	88.7	94.2	0.0	0.0	0.0	0.0
Aircraft and missiles	372,376	1.2	1.8	35.2	3.6	2.1	4.3	84.0	89.7	83.8	78.6	0.0	0.9	0.8	0.0
Professional and scientific instruments	38	8.9	7.6	56.5	19.8	7.1	51.2	79.5	79.4	80.9	0.0	0.0	37.7	12.7	1.0
Scientific and mechanical measuring instruments	381–82	14.7	11.5	60.6	30.9	11.9	52.4	79.0	79.0	81.2	63.9	0.0	53.7	13.4	0.3
Optical, surgical, photographic, and other instruments	384–87	3.3	3.6	47.6	3.3	3.1	12.4	80.2	80.2	80.6	53.0	0.0	13.2	12.2	1.1
Other manufacturing industries	27,31,39	1.7	0.2	30.9	7.9	8.0	0.0	51.8	49.9	55.6	56.7	0.0	0.0	3.1	1.9
Nonmanufacturing		4.1	0.2	20.6	8.5	6.0	27.5	38.9	38.0	45.4	35.8	51.4	62.5	7.3	2.8
Transportation and utilities	40–42, 44–49	7.9	4.8	13.8	11.7	12.0	7.4	18.6	28.2	23.2	0.0	0.0	1.3	0.2	0.0
Communications	48	12.2	4.0	6.4	11.9	12.3	0.0	17.7	27.1	20.1	0.0	0.0	0.0	0.0	0.0
Telephone communications	481	12.6	4.4	6.1	12.0	12.4	0.0	17.4	26.9	20.0	12.9	0.0	0.0	0.0	0.0
Other communications	482–484, 489	0.0	0.2	15.9	2.8	2.8	0.0	56.5	54.3	55.0	54.9	0.0	0.0	0.0	0.0
Electric, gas, and sanitary services	49	4.3	4.2	65.3	7.6	10.0	6.2	40.2	36.2	37.2	35.9	0.0	1.3	0.4	0.0
Other transportation and utilities	40–42,44–47	6.4	6.0	45.8	21.4	8.8	100.0	59.9	55.7	55.7	58.1	0.0	0.0	0.0	0.0
		2.8	0.7	10.6	1.6	1.6	0.0	25.2	24.6	25.9	13.5	0.0	0.0	13.4	1.6

See explanatory information and SOURCE at end of table.

Table B-4. Imputation rates for selected items, by industry: 1995

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Industry	SIC code	Net sales	Total employment	R&D scientists/ engineers	Total R&D			R&D by cost			R&D by state	Energy R&D	Pollution abatement	R&D outside company	Foreign R&D
					Total	Company	Federal	Wages	Materials	Other costs					
		[Percent]													
Trade	50–59	1.0%	0.0%	30.8%	6.4%	6.5%	0.0%	91.0%	94.4%	88.5%	71.8%	0.0%	0.0%	52.3%	0.0%
Finance, insurance, and real estate	60–65,67														
Services	701,72,73, 75–81,83, 84,87,89	2.5	2.6	25.8	10.3	6.0	24.4	57.6	44.7	65.3	0.0	51.2	89.5	2.5	2.8
Business services	73	3.3	2.6	18.4	6.6	7.0	1.3	54.1	39.1	58.3	0.0	0.0	0.0	10.9	5.1
Computer and data processing services	737	4.3	4.2	18.8	6.5	6.9	0.0	53.7	38.7	58.2	54.5	0.0	0.0	11.8	5.1
Other business services	731–736,738	0.4	1.6	8.1	11.3	13.7	8.0	76.0	68.3	79.6	72.6	0.0	0.0	0.2	0.0
Health services	80	1.2	1.6	8.1	0.5	1.1	14.1	2.9	1.9	5.6	0.0	0.0	0.0	0.1	0.3
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	0.0	0.0	3.6	0.0	0.0	0.0	2.0	1.3	5.4	1.3	0.0	0.0	0.1	0.0
Other health services	802–805, 808–809	6.1	3.3	43.7	23.3	50.4	37.8	79.5	89.8	92.4	82.8	0.0	0.0	0.0	25.2
Engineering and management services	87	4.1	6.7	38.9	16.0	4.9	28.3	73.8	66.6	77.1	0.0	51.4	94.4	1.7	1.1
Engineering, architectural, and surveying	871	0.5	1.4	48.9	1.1	1.0	1.1	89.1	87.9	88.7	80.7	2.4	0.0	0.0	0.0
Research, development, and testing	873	6.6	22.5	31.9	26.0	6.5	57.2	63.1	51.3	68.6	62.9	88.2	96.2	1.9	1.1
Other engineering and management services	872,874	14.5	10.5	12.6	3.3	1.8	100.0	37.5	32.9	30.7	40.9	0.0	0.0	0.0	0.0
Other services	701,72, 75–79,81, 83,84,89	0.3	0.3	11.0	1.3	0.7	26.8	5.5	5.7	47.6	10.7	0.0	0.0	3.3	0.0
Other nonmanufacturing industries	07–12,14,15, 161–162,17	2.0	0.0	2.8	0.9	0.9	0.0	46.2	46.4	46.2	32.6	0.0	0.0	17.9	8.6

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

Table B-4a. Imputation rates for selected items, by industry: 1996

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Industry	SIC code	Net Sales	Total employment	R&D scientists/ engineers	Total R&D			R&D by cost			R&D by state	Energy R&D	Pollution abatement	R&D outside company	Foreign R&D
					Total	Company	Federal	Wages	Materials	Other costs					
		[Percent]													
All Industries		4.0%	5.1%	33.3%	8.0%	6.1%	27.0%	-	-	-	-	-	-	7.6%	16.8%
Manufacturing		4.5	5.8	39.7	7.0	4.3	23.9	-	-	-	-	-	-	4.5	7.9
Food, kindred, and tobacco products	20,21	2.8	2.9	22.9	3.2	4.7	0.0	-	-	-	-	-	-	2.8	1.3
Textiles and apparel	22,23	11.6	11.3	21.5	12.8	12.9	0.0	-	-	-	-	-	-	0.0	1.5
Lumber, wood products, and furniture	24,25	3.3	2.2	43.1	3.2	3.2	0.0	-	-	-	-	-	-	0.0	25.3
Paper and allied products	26	16.2	18.8	64.7	47.5	45.9	99.0	-	-	-	-	-	-	21.3	68.8
Chemicals and allied products	28	3.5	4.3	20.9	1.3	1.3	0.8	-	-	-	-	-	-	5.7	4.8
Industrial chemicals	281–82,286	1.2	1.2	26.1	1.0	1.0	0.6	-	-	-	-	-	-	0.0	0.0
Drugs and medicines	283	4.9	5.9	14.8	1.0	1.0	32.3	-	-	-	-	-	-	6.8	8.5
Other chemicals	284–85, 287–89	5.7	7.3	27.8	3.2	3.2	0.0	-	-	-	-	-	-	0.1	0.7
Petroleum refining and extraction	13,29	1.5	1.6	27.9	0.4	0.4	0.0	-	-	-	-	-	-	0.0	0.0
Rubber products	30	4.6	7.9	38.5	5.7	6.2	0.0	-	-	-	-	-	-	0.9	1.0
Stone, clay, and glass products	32	0.4	0.6	32.7	1.1	1.1	20.0	-	-	-	-	-	-	0.0	0.0
Primary metals	33	3.0	3.6	54.0	2.8	4.2	0.0	-	-	-	-	-	-	2.8	8.3
Ferrous metals and products	331–32, 3398–99	3.2	2.9	13.3	6.6	6.7	0.0	-	-	-	-	-	-	0.0	0.0
Nonferrous metals and products	333–36	2.7	4.3	70.6	1.7	2.9	0.0	-	-	-	-	-	-	3.9	15.8
Fabricated metal products	34	5.8	4.2	27.1	3.8	4.3	0.0	-	-	-	-	-	-	0.0	1.3
Machinery	35	5.7	6.0	20.9	4.7	4.7	17.2	-	-	-	-	-	-	3.2	0.1
Office, computing, and accounting machines	357	1.9	4.1	13.7	3.2	3.2	0.1	-	-	-	-	-	-	3.0	0.0
Other machinery, except electrical	351–56, 358–59	7.4	6.5	28.5	7.0	7.0	30.6	-	-	-	-	-	-	3.5	0.2

See explanatory information and SOURCE at end of table.

Table B-[illegible]. Imputation rates for selected items, by industry: [illegible]

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Industry	SIC code	Net Sales	Total employment	R&D scientists/ engineers	Total R&D			R&D by cost			R&D by state	Energy R&D	Pollution abatement	R&D outside company	Foreign R&D
					Total	Company	Federal	Wages	Materials	Other costs					
		[Percent]													
Electrical equipment	36	4.9%	5.4%	48.8%	3.4%	4.6%	2.3%	-	-	-	-	-	-	1.4%	2.5%
Radio and TV receiving equipment	365	0.9	4.9	4.6	0.9	0.9	0.0	-	-	-	-	-	-	0.0	69.2
Communication equipment	366	9.2	11.7	59.1	5.8	6.4	0.1	-	-	-	-	-	-	0.8	0.7
Electronic components	367	4.1	4.7	53.4	2.7	2.7	2.5	-	-	-	-	-	-	2.0	1.2
Other electrical equipment	361–64,369	4.3	3.5	18.1	3.3	10.5	5.1	-	-	-	-	-	-	0.6	4.8
Transportation equipment	37	2.4	4.2	53.2	7.8	1.2	18.8	-	-	-	-	-	-	0.2	0.0
Motor vehicles and motor vehicles equipment	371	0.1	0.2	37.2	0.4	0.4	0.0	-	-	-	-	-	-	0.2	0.0
Other transportation equipment	373–75,379	12.3	11.2	42.5	0.3	0.6	0.0	-	-	-	-	-	-	0.0	0.0
Aircraft and missiles	372,376	6.5	6.9	64.4	15.3	3.4	21.8	-	-	-	-	-	-	0.0	0.0
Professional and scientific instruments	38	9.9	10.6	57.4	20.7	9.8	43.2	-	-	-	-	-	-	6.8	2.5
Scientific and mechanical measuring instruments	381–82	16.2	13.6	63.2	30.4	13.9	44.6	-	-	-	-	-	-	1.1	3.8
Optical, surgical, photographic, and other instruments	384–87	4.6	7.9	45.9	7.1	7.2	5.1	-	-	-	-	-	-	7.8	2.2
Other manufacturing industries 1/	27,31,39	3.7	4.8	8.4	2.4	3.0	0.0	-	-	-	-	-	-	4.6	4.8
Nonmanufacturing		3.2	4.0	17.1	11.4	11.5	44.0	-	-	-	-	-	-	11.6	48.0
Transportation and utilities	40–42,44–49	3.6	5.1	13.7	12.6	12.7	8.9	-	-	-	-	-	-	0.7	0.0
Communications	48	0.0	2.1	6.1	13.3	13.8	0.0	-	-	-	-	-	-	0.4	0.0
Telephone communications	481	0.0	2.1	5.3	13.4	13.9	0.0	-	-	-	-	-	-	0.0	0.0
Other communications	482–484,489	0.3	2.4	29.5	9.1	9.1	0.0	-	-	-	-	-	-	50.1	0.0

See explanatory information and SOURCE at end of table.

Table B-4a. Imputation rates for selected items, by industry: 1995

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Industry	SIC code	Net Sales	Total employment	R&D scientists/ engineers	Total R&D			R&D by cost			R&D by state	Energy R&D	Pollution abatement	R&D outside company	Foreign R&D
					Total	Company	Federal	Wages	Materials	Other costs					
		[Percent]													
Electric, gas, and sanitary services	49	7.4%	12.9%	56.5%	7.1%	6.6%	11.0%	-	-	-	-	-	-	9.0%	0.0%
Other transportation and utilities	40–42,44–47	1.9	0.8	37.8	7.2	2.0	100.0	-	-	-	-	-	-	7.1	0.0
Trade	50–59	4.3	2.0	12.5	4.9	20.1	89.9	-	-	-	-	-	-	5.5	4.8
Finance, insurance, and real estate	60–65,67	0.9	3.3	28.1	5.3	5.1	100.0	-	-	-	-	-	-	70.6	0.0
Services	701,72,73, 75–81,83, 84,87,89	6.1	4.9	19.9	14.5	9.0	43.1	-	-	-	-	-	-	17.2	58.5
Business services	73	4.9	3.3	16.7	5.7	5.5	22.1	-	-	-	-	-	-	18.0	6.7
Computer and data processing services	737	5.7	8.7	17.1	5.7	5.4	23.0	-	-	-	-	-	-	18.1	6.8
Other business services	731–736,738	0.4	0.1	4.3	6.0	6.3	0.0	-	-	-	-	-	-	0.0	0.0
Health services	80	32.1	25.8	33.2	69.2	69.5	12.7	-	-	-	-	-	-	73.8	99.3
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	34.2	19.8	32.0	71.5	71.7	18.0	-	-	-	-	-	-	81.2	99.4
Other health services	802–805, 808–809	0.0	48.6	59.4	0.0	0.0	0.0	-	-	-	-	-	-	0.0	0.0
Engineering and management services	87	7.4	7.4	25.5	22.0	7.5	46.0	-	-	-	-	-	-	8.5	4.2
Engineering, architectural, and surveying	871	1.5	3.0	26.1	8.4	15.6	3.7	-	-	-	-	-	-	8.7	3.3
Research, development, and testing	873	8.8	11.1	21.4	26.8	6.2	72.0	-	-	-	-	-	-	8.5	4.4
Other engineering and management services	872,874	17.9	0.1	64.4	2.9	2.1	5.4	-	-	-	-	-	-	0.0	0.0

See explanatory information and SOURCE at end of table.

Table B-4a. Imputation rates for selected items, by industry: 1996

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Industry	SIC code	Net Sales	Total employment	R&D scientists/ engineers	Total R&D			R&D by cost			R&D by state	Energy R&D	Pollution abatement	R&D outside company	Foreign R&D
					Total	Company	Federal	Wages	Materials	Other costs					
		[Percent]													
Other services	701,72,75–79, 81,83,84,89	0.1%	0.1%	4.1%	6.2%	6.3%	0.0%	-	-	-	-	-	-	0.0%	92.8%
Other nonmanufacturing industries 1/	07--12,14,15, 161–162,17	0.8	0.8	3.0	1.2	1.6	0.0	-	-	-	-	-	-	0.0	0.0

1/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not comparable with statistics for prior years.

KEY: - = No data collected for these items in the 1996 Survey of Industrial Research and Development.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

[illegible] R&D-performing companies [illegible] to selected items: 1995

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Data Item	Response rate 1/	
	Form RD-1L 2/	Form RD-1A 2/
Sales	97.9%	97.5%
Total employment	98.1	99.0
Scientist and engineers	75.4	85.8
Federal R&D	99.6	99.9
Company R&D	3/	3/
Total R&D	100.0	100.0
Foreign R&D	35.7	57.2
Contracted out	39.2	51.3
Energy R&D	23.4	4/
Pollution abatement R&D	21.8	4/

1/ Response rates are based on reported data for companies that reported total R&D expenditures. Imputed data are not included. Companies that reported that they were out of scope, out of business, merged with another company, or had no R&D expenditures for 1995 were excluded from the calculation of response rates.

2/ See technical notes for descriptions of the survey questionnaire forms.

3/ Item response for "Federal R&D" and for "Company R&D" are considered together; companies that report "Total R&D" and either of these expenditures implicitly report both company and Federal R&D, since these two items sum to total R&D.

4/ Response rates are not provided because form RD-1A does not include these items. See technical notes for more information about the contents of the questionnaire.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

[illegible] percentage of R&D-performing companies that responded to selected items: 1996

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Data Item	Response rate 1/	
	Form RD-1S 2/	Form RD-1A 2/
Sales	98.6%	97.6%
Total employment	99.1	98.0
Scientist and engineers	80.9	86.0
Federal R&D	99.6	100.0
Company R&D	3/	3/
Total R&D	100.0	100.0
Foreign R&D	35.1	41.6
Contracted out	35.9	42.6
Energy R&D	4/	4/
Pollution abatement R&D	4/	4/

1/ Response rates are based on reported data for companies that reported total R&D expenditures. Imputed data are not included. Companies that reported they were out of scope, out of business, merged with another company, or had no R&D expenditures for 1996 were excluded from the calculation of response rates.

2/ See technical notes for descriptions of the survey questionnaire forms.

3/ Item response for "Federal R&D" and for "Company R&D" are considered together; companies that report "Total R&D" and either of these expenditures implicitly report both company and Federal R&D, since these two items sum to total R&D.

4/ Response rates are not provided because forms RD-1S and RD-1A do not include these items. See technical notes for more information about the contents of the questionnaire.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

CHARACTER OF WORK

Response to questions about character of work (basic research, applied research, and development) declined in the mid-1980's, and, as a result, imputation rates increased. The general imputation procedure described above became increasingly dependent upon information imputed in prior years, thereby distancing current-year estimates from any reported information. Because of the increasing dependence on imputed data, NSF chose not to publish character-of-work estimates in 1986. Consequently, the imputation procedure used to develop these estimates was revised in 1987 for use with 1986 and later data and differs from the general imputation approach. The new method calculates the character-of-work distribution for a nonresponding firm only if that firm reported a distribution within a 5-year period, extending from 2 years before to 2 years after the year requiring imputation. Imputation for a given year is initially performed in the year the data are collected and is based on a character-of-work distribution reported in either of the 2 previous years, if any. It is again performed using new data collected in the next 2 years. If reported data followed no previously imputed or reported data, previous period estimates were inserted based on the currently reported information. Likewise, if reported data did not follow 2 years of imputed data, the 2 years of previously imputed data were removed. Thus, character-of-work estimates were revised as newly reported information became available and were not final for 2 years following their initial publication.

Beginning with 1995, previously estimated values were not removed for firms that did not report in the third year, nor were estimates made for the 2 previous years for firms reporting after 2 years of nonresponse. This process was changed because in the prior period revisions were minimal. Estimates continue to be made for 2 consecutive years of nonresponse and discontinued if the firm does not report character of work in the third year.

If no reported data are available for a firm, character-of-work estimates are not imputed. As a consequence, only a portion of the total estimated R&D expenditures are distributed at the firm level. Those expenditures not meeting the requirements of the new imputation methodology are placed in a "not distributed" category. Tables B-6, B-7, B-8, and B-9 show the character-of-work estimates along with the "not distributed" component for 1993, 1994, 1995, and 1996 respectively. NSF's objective in conducting the survey has always been to provide estimates for the entire population of firms performing R&D in the United States. However, the revised imputation procedure would no longer produce such estimates because of the "not distributed" component. So, a baseline estimation method was developed to allocate the "not distributed" amounts among the character-of-work components. In the baseline estimation method, the "not distributed" expenditures are allocated by industry group to basic research, applied research, and development categories, using the percentage splits in the distributed category for that industry. The allocation is done at the lowest level of published industry detail only; higher levels are derived by aggregation, just as national totals are derived by aggregation of individual industry estimates, and result in higher performance shares for basic and applied research and lower estimates for development's share than would have been calculated using the previous method.[8] The estimates of basic research, applied research, and development provided in the tables in section A of this report were calculated using the baseline estimation method.

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[8] See the NSF technical report cited above for an explanation of the uncertainties in the data and to quantify their sensitivity to the choice of various possible imputation procedures.

[illegible]

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Industry	SIC code	Total			Basic research			Applied research		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]								
All Industries		$117,400	$22,809	$94,591	$6,297	$952	$5,345	$22,043	$4,698	$17,345
Manufacturing		86,569	16,669	69,901	4,090	283	3,808	15,756	2,169	13,587
Food, kindred, and tobacco products	20,21	1,345	0	1,345	83	0	83	374	0	374
Textiles and apparel	22,23	(D)	(D)	286	(D)	(D)	29	(D)	(D)	25
Lumber, wood products, and furniture	24,25	(D)	(D)	196	(D)	(D)	13	42	0	42
Paper and allied products	26	(D)	(D)	1,191	(D)	(D)	167	(D)	(D)	449
Chemicals and allied products	28	(D)	(D)	16,658	2,112	13	2,099	(D)	(D)	5,313
Industrial chemicals	281–82,286	(D)	(D)	5,165	(D)	(D)	885	(D)	(D)	1,201
Drugs and medicines	283	9,146	15	9,132	(D)	(D)	(D)	3,379	8	3,371
Other chemicals	284–85,287–89	(D)	(D)	2,361	(D)	(D)	(D)	(D)	(D)	741
Petroleum refining and extraction	13,29	2,152	14	2,138	(D)	(D)	(D)	(D)	(D)	(D)
Rubber products	30	(D)	(D)	1,059	24	0	24	(D)	(D)	130
Stone, clay, and glass products	32	538	9	529	(D)	(D)	49	(D)	(D)	165
Primary metals	33	669	23	646	(D)	(D)	43	201	6 (S)	195
Ferrous metals and products	331–32,3398–99	289	17	272	(D)	(D)	19	(D)	(D)	77
Nonferrous metals and products	333–36	380	6	374	24	0	24	(D)	(D)	118 (S)
Fabricated metal products	34	1,158	222	936	(D)	(D)	77	152	7	144
Machinery	35	8,381	86	8,295	(D)	(D)	241	(D)	(D)	1,369
Office, computing, and accounting machines	357	4,950	33	4,917	(D)	(D)	78	(D)	(D)	802
Other machinery, except electrical	351–56,358–59	3,431	53	3,378	(D)	(D)	163	(D)	(D)	568
Electrical equipment	36	13,349	1,667	11,682	(D)	(D)	258	(D)	(D)	2,027
Radio and TV receiving equipment	365	(D)	(D)	87	9	0	9	(D)	(D)	11
Communication equipment	366	(D)	(D)	3,954	(D)	(D)	(D)	342	0	342
Electronic components	367	5,311	206	5,105	(D)	1	(D)	959	35 (S)	925
Other electrical equipment	361–64,369	(D)	(D)	2,537	(D)	(D)	97	(D)	(D)	749
Transportation equipment	37	27,258	10,617	16,640	(D)	(D)	116	1,893	887	1,006
Motor vehicles and motor vehicles equipment	371	(D)	(D)	10,659	(D)	(D)	74	(D)	(D)	460
Other transportation equipment	373–75,379	(D)	(D)	297	(D)	0	(D)	(D)	(D)	7
Aircraft and missiles	372,376	15,056	9,372	5,684	(D)	(D)	(D)	1,345	807	539
Professional and scientific instruments	38	10,119	2,577	7,542	(D)	(D)	369	1,957	295	1,661
Scientific and mechanical measuring instruments	381–82	5,681	2,484	3,196	(D)	(D)	129	1,338	275	1,063
Optical, surgical, photographic, and other instruments	384–87	4,438	92	4,346	(D)	(D)	240	619	21	598

See explanatory information and SOURCE at end of table.

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[illegible] performance of basic research, applied research, development, funds not distributed, and [illegible] percent of funds not distributed, by industry, and source of funds: 1993

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Industry	SIC code	Total			Basic research			Applied research		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]								
Other manufacturing industries	27,31,39	(D)	(D)	$758	(D)	(D)	$120	$69	$0	$69
Nonmanufacturing 1/		$30,831	$6,140	24,690	$2,207	$669	1,537	6,287	2,529	3,758
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trade	50–59	NA	NA	NA	NA	NA	NA	NA	NA	NA
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA
Services	701,72,73,75–81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other health services	802–805,808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other services	701,72,75–79,81, 83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other nonmanufacturing industries	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA

See explanatory information and SOURCE at end of table.

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[illegible]

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Industry	SIC code	Development			Expenditures not distributed			Percent of expenditures not distributed		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]						[Percent]		
All industries		$77,552	$16,561	$60,991	$11,507	$597 (S)	$10,910	9.8%	2.6%	11.5%
Manufacturing		56,233	13,632	42,601	10,489	584	9,905	NA	NA	NA
Food, kindred, and tobacco products	20,21	701	0	701	188	0	188	14.0	0.0	14.0
Textiles and apparel	22,23	(D)	(D)	142	(D)	(D)	89	33.0	71.4	31.1
Lumber, wood products, and furniture	24,25	(D)	(D)	116	(D)	(D)	24	12.1	0.0	12.2
Paper and allied products	26	389	0	389	187	0	187	(D)	(D)	15.7
Chemicals and allied products	28	(D)	(D)	7,949	(D)	(D)	1,296	7.2	0.1	7.8
Industrial chemicals	281–82,286	(D)	(D)	2,856	(D)	(D)	222 (S)	3.4	0.1	4.3
Drugs and medicines	283	(D)	(D)	(D)	(D)	0	(D)	(D)	(D)	(D)
Other chemicals	284–85,287–89	(D)	(D)	(D)	(D)	(D)	(D)	5.4	(D)	(D)
Petroleum refining and extraction	13,29	751	11	740	(D)	0	(D)	(D)	0.0	(D)
Rubber products	30	(D)	(D)	708	197	0	197	(D)	(D)	18.6
Stone, clay, and glass products	32	276	4	272	(D)	(D)	43	(D)	(D)	8.1
Primary metals	33	(D)	(D)	358	50 (S)	0	50 (S)	7.5	0.0	7.7
Ferrous metals and products	331–32,3398–99	(D)	(D)	147	29 (S)	0	29 (S)	10.0	0.0	10.7
Nonferrous metals and products	333–36	(D)	(D)	211	21	0	21	5.5	0.0	5.6
Fabricated metal products	34	(D)	(D)	507	(D)	(D)	208	(D)	(D)	22.2
Machinery	35	5,481	62	5,419	(D)	(D)	1,266 (S)	15.2	4.7	15.3
Office, computing, and accounting machines	357	3,300	28	3,272	766 (S)	0	766 (S)	15.5	0.0	15.6
Other machinery, except electrical	351–56,358–59	2,181	34	2,147	(D)	(D)	500	(D)	(D)	14.8
Electrical equipment	36	6,640	1,080	5,560	(D)	(D)	3,837	(D)	(D)	32.8
Radio and TV receiving equipment	365	(D)	(D)	58	9	0	9	(D)	(D)	10.3
Communication equipment	366	(D)	(D)	(D)	(D)	(D)	(D)	40.6	41.1	(D)
Electronic components	367	(D)	171	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Other electrical equipment	361–64,369	(D)	(D)	1,213	(D)	(D)	478	15.0	0.2	18.8
Transportation equipment	37	(D)	(D)	14,503	(D)	(D)	1,016	(D)	(D)	6.1
Motor vehicles and motor vehicles equipment	371	(D)	(D)	10,080	45	0	45	(D)	(D)	0.4
Other transportation equipment	373–75,379	(D)	(D)	(D)	(D)	0	(D)	11.0	0.0	(D)
Aircraft and missiles	372,376	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Professional and scientific instruments	38	7,063	2,257	4,806	(D)	(D)	706	(D)	(D)	9.4
Scientific and mechanical measuring instruments	381–82	(D)	(D)	1,746	(D)	(D)	258 (S)	(D)	(D)	8.1
Optical, surgical, photographic, and other instruments	384–87	(D)	(D)	3,060	448	0	448	10.1	0.0	10.3

See explanatory information and SOURCE at end of table.

Table B-6. Funds for performance of basic research, applied research, development, funds not distributed, and [illegible] percent of funds not distributed, by industry and source of funds: 1993

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Industry	SIC code	Development			Expenditures not distributed			Percent of expenditures not distributed		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]						[Percent]		
Other manufacturing industries	27,31,39	(D)	(D)	$431	$139	$0	$139	(D)	(D)	18.3%
Nonmanufacturing		$21,319	$2,929	18,390	1,018	13	1,005	3.3%	0.2%	4.1
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trade	50–59	NA	NA	NA	NA	NA	NA	NA	NA	NA
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA
Services	701,72,73,75–81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other health services	802–805,808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other services	701,72,75–79,81, 83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other nonmanufacturing industries	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA

1/ Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent.

NA = Not available.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1993

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Table B-7. Funds for performance of basic research, applied research, development, funds not distributed, and percent of funds not distributed, by industry and source of funds: 1994

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Industry	SIC code	Total			Basic research			Applied research		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]								
All Industries		$119,595	$22,463	$97,131	$6,374	$921	$5,453	$20,934	$4,040	$16,894
Manufacturing		90,749	17,373	73,375	4,413	241	4,172	14,991	2,033	12,959
Food, kindred, and tobacco products	20,21	1,476	0	1,476	101	0	101	419	0	419
Textiles and apparel	22,23	(D)	(D)	316	(D)	(D)	27	(D)	(D)	32
Lumber, wood products, and furniture	24,25	(D)	(D)	201	(D)	(D)	23	(D)	(D)	37
Paper and allied products	26	(D)	(D)	1,263	(D)	(D)	175	(D)	(D)	507
Chemicals and allied products	28	(D)	(D)	16,559	2,405	9	2,396	(D)	(D)	4,896
Industrial chemicals	281–82,286	(D)	(D)	4,780	(D)	(D)	1,030	(D)	(D)	(D)
Drugs and medicines	283	9,633	8	9,625	(D)	1	(D)	2,959	5	2,954
Other chemicals	284–85,287–89	(D)	(D)	2,154	(D)	(D)	(D)	(D)	(D)	(D)
Petroleum refining and extraction	13,29	1,950	10	1,939	(D)	0	(D)	464	6	459
Rubber products	30	(D)	(D)	1,432	25	0	25	(D)	(D)	145
Stone, clay, and glass products	32	591	38	553	47	0	47	200	37	163
Primary metals	33	690	17	672	(D)	(D)	92	(D)	(D)	187
Ferrous metals and products	331–32,3398–99	(D)	(D)	241	(D)	(D)	17	(D)	(D)	77
Nonferrous metals and products	333–36	(D)	(D)	431	75	0	75	(D)	(D)	110
Fabricated metal products	34	1,111	243	868	(D)	(D)	69	(D)	(D)	162
Machinery	35	8,110	99	8,011	235	7	228	1,351	36	1,316
Office, computing, and accounting machines	357	4,106	28	4,078	(D)	(D)	60	(D)	(D)	692
Other machinery, except electrical	351–56,358–59	4,004	71	3,933	(D)	(D)	169	(D)	(D)	624
Electrical equipment	36	15,338	1,801	13,537	(D)	(D)	272	(D)	(D)	1,732
Radio and TV receiving equipment	365	(D)	(D)	64	(D)	(D)	(D)	(D)	0	(D)
Communication equipment	366	(D)	(D)	4,939	(D)	(D)	(D)	(D)	(D)	(D)
Electronic components	367	6,032	162	5,870	(D)	(D)	80	(D)	(D)	908
Other electrical equipment	361–64,369	(D)	(D)	2,664	(D)	(D)	97	(D)	(D)	410
Transportation equipment	37	28,087	10,392	17,695	228	102	126	1,926	739 (S)	1,186
Motor vehicles and motor vehicles equipment	371	(D)	(D)	11,950	(D)	(D)	(D)	(D)	(D)	(D)
Other transportation equipment	373–75,379	(D)	(D)	279	27	0	27	(D)	(D)	(D)
Aircraft and missiles	372,376	14,260	8,794	5,466	(D)	(D)	(D)	(D)	(D)	(D)
Professional and scientific instruments	38	11,441	3,384	8,058	(D)	(D)	415	1,901	298	1,603
Scientific and mechanical measuring instruments	381–82	6,952	3,266	3,687	(D)	(D)	172	1,292	270	1,021
Optical, surgical, photographic, and other instruments	384–87	4,489	118	4,371	(D)	(D)	243	610	28	582

See explanatory information and SOURCE at end of table.

Table B-7. Funds for performance of basic research, applied research, development, funds not distributed, and percent of funds not distributed, by industry and source of funds: 1994

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Industry	SIC code	Total			Basic research			Applied research		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]								
Other manufacturing industries	27,31,39	(D)	(D)	$796	(D)	(D)	$83	$116	$0	$116
Nonmanufacturing		$28,846	$5,090	23,756	$1,961	$680	1,281	5,943	2,007	3,935
Transportation and utilities	40–42,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trade	50–59	NA	NA	NA	NA	NA	NA	NA	NA	NA
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA
Services	701,72,73,75–81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other health services	802–805,808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other services	701,72,75–79,81, 83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other nonmanufacturing industries	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA

See explanatory information and SOURCE at end of table.

[illegible] Table B-[illegible]. Funds [illegible] performance of basic research, applied research, development, funds not distributed, and [illegible] percent of funds not distributed, by industry and source of funds: 1994

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Industry	SIC code	Development			Expenditures not distributed			Percent of expenditures not distributed		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]						[Percent]		
All Industries		$79,937	$16,217	$63,719	$12,350	$1,285 (S	$11,065	0.0%	0.1%	0.1%
Manufacturing		60,052	13,883	46,167	11,293	1,216	10,077	0.0	0.0	0.0
Food, kindred, and tobacco products	20,21	788	0	788	168	0	168	11.4	0.0	11.4
Textiles and apparel	22,23	(D)	(D)	153	(D)	(D)	104 (S)	34.9	75.0	32.9
Lumber, wood products, and furniture	24,25	(D)	(D)	113	27	0	27	(D)	(D)	13.4
Paper and allied products	26	360	0	360	221	0	221	(D)	(D)	17.5
Chemicals and allied products	28	8,458	610	7,848	(D)	(D)	1,419	8.0	0.1	8.6
Industrial chemicals	281–82,286	(D)	(D)	(D)	(D)	(D)	202 (S)	3.4	0.1	4.2
Drugs and medicines	283	(D)	2	(D)	(D)	0	(D)	(D)	(D)	(D)
Other chemicals	284–85,287–89	(D)	(D)	(D)	138	0	138	(D)	(D)	6.4
Petroleum refining and extraction	13,29	(D)	5	(D)	(D)	0	(D)	(D)	0.0	(D)
Rubber products	30	894	0	894	369	0	369	(D)	(D)	25.8
Stone, clay, and glass products	32	310	1	308	35	0	35	5.9	0.0	6.3
Primary metals	33	(D)	(D)	329	65	0	65	9.4	0.0	9.7
Ferrous metals and products	331–32,3398–99	(D)	(D)	126	21 (S)	0	21 (S)	(D)	(D)	8.7
Nonferrous metals and products	333–36	(D)	(D)	203	44	0	44	(D)	(D)	10.2
Fabricated metal products	34	739	205	534	(D)	(D)	103	(D)	(D)	11.9
Machinery	35	5,906	57	5,849	617	0	617	7.5	0.0	7.6
Office, computing, and accounting machines	357	3,217	13	3,204	122 (S)	0	122 (S)	3.0	0.0	3.0
Other machinery, except electrical	351–56,358–59	2,689	43	2,646	495	0	495	12.2	0.0	12.4
Electrical equipment	36	8,089	1,051 (S)	7,038	(D)	(D)	4,495	(D)	(D)	33.2
Radio and TV receiving equipment	365	34	0	34	(D)	(D)	4	(D)	(D)	6.3
Communication equipment	366	(D)	(D)	2,529	(D)	(D)	(D)	(D)	(D)	(D)
Electronic components	367	3,013	150	2,864	(D)	0	(D)	(D)	(D)	(D)
Other electrical equipment	361–64,369	(D)	(D)	1,612	(D)	(D)	545	17.2	0.6	20.5
Transportation equipment	37	24,650	8,989	15,662	1,284	563	721	4.6	5.4	4.1
Motor vehicles and motor vehicles equipment	371	(D)	(D)	(D)	69	0	69	(D)	(D)	0.6
Other transportation equipment	373–75,379	(D)	(D)	(D)	(D)	0	(D)	(D)	(D)	28.7
Aircraft and missiles	372,376	11,770	7,468	4,302	(D)	563	(D)	8.0	6.4	10.4
Professional and scientific instruments	38	(D)	(D)	5,032	(D)	(D)	1,007	(D)	(D)	12.5
Scientific and mechanical measuring instruments	381–82	(D)	(D)	1,929	(D)	(D)	564 (S)	(D)	(D)	15.3
Optical, surgical, photographic, and other instruments	384–87	(D)	(D)	3,103	443	0	443	9.9	0.0	10.1

See explanatory information and SOURCE at end of table.

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Table B-[illegible]. Funds for performance of basic research, applied research, development, funds not distributed, and percent of funds not distributed, by industry, and source of funds: 1994

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Industry	SIC code	Development			Expenditures not distributed			Percent of expenditures not distributed		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]						[Percent]		
Other manufacturing industries	27,31,39	(D)	(D)	$515	$81	$0	$81	(D)	(D)	10.2%
Nonmanufacturing		$19,885	$2,334 (S)	17,552	1,057	69	988	0.0%	0.0%	0.0
Transportation and utilities	40–41,44–49	NA	NA	NA	NA	NA	NA	NA	NA	NA
Communications	48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Telephone communications	481	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other communications	482–484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA
Electric, gas, and sanitary services	49	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other transportation and utilities	40–42,44–47	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trade	50–59	NA	NA	NA	NA	NA	NA	NA	NA	NA
Finance, insurance, and real estate	60–65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA
Services	701,72,73,75–81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA
Business services	73	NA	NA	NA	NA	NA	NA	NA	NA	NA
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other business services	731–736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA
Health services	80	NA	NA	NA	NA	NA	NA	NA	NA	NA
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other health services	802–805,808–809	NA	NA	NA	NA	NA	NA	NA	NA	NA
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	NA
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other services	701,72,75–79,81, 83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other nonmanufacturing industries	07–12,14,15, 161–162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.
NA = Not available.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1994

[illegible] basic research, applied research, development, funds not distributed, and [illegible] funds not distributed, by industry, size of company, and source of funds: 1995

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Industry and size of company	SIC code	Total			Basic research			Applied research		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]								
All Industries		$132,103	$23,451	$108,652	$5,093	$511	$4,581	$22,470	$2,725	$19,744
Distribution by industry:										
Manufacturing		100,067	18,831	81,236	3,086	207	2,879	16,154	1,575	14,579
Food, kindred, and tobacco products	20,21	1,566	0	1,566	136	0	136	453	0	453
Textiles and apparel	22,23	(D)	(D)	381	22	0	22	(D)	(D)	37
Lumber, wood products, and furniture	24,25	(D)	(D)	229	17	0	17	31	0	31
Paper and allied products	26	(D)	(D)	1,404	193 (S)	0	193 (S)	(D)	(D)	556 (S)
Chemicals and allied products	28	17,547	210 (S)	17,337	(D)	(D)	1,225	(D)	(D)	4,348
Industrial chemicals	281–82,286	(D)	(D)	5,139	(D)	(D)	426	(D)	(D)	1,191
Drugs and medicines	283	10,215	14	10,202	720	2	718	2,484	5	2,479
Other chemicals	284–85,287–89	(D)	(D)	1,996	(D)	(D)	81	(D)	(D)	678
Petroleum refining and extraction	13,29	1,760	6	1,754	84	0	84	(D)	(D)	523
Rubber products	30	(D)	(D)	1,210	55	0	55	(D)	(D)	174
Stone, clay, and glass products	32	448	6	441	15	0	15	(D)	(D)	136
Primary metals	33	593	13	580	30	0	30	(D)	(D)	134
Ferrous metals and products	331–32,3398–99	(D)	(D)	217	13	0	13	77	0	77
Nonferrous metals and products	333–36	(D)	(D)	363	18	0	18	(D)	(D)	57
Fabricated metal products	34	1,023	86	937	(D)	(D)	60	138	9	128
Machinery	35	(D)	(D)	9,676	(D)	(D)	220	2,153	27	2,126
Office, computing, and accounting machines	357	(D)	(D)	4,699	(D)	(D)	22	(D)	(D)	1,227
Other machinery, except electrical	351–56,358–59	5,041	64	4,976	(D)	(D)	198	(D)	(D)	899
Electrical equipment	36	18,751	1,690	17,060	(D)	(D)	178	(D)	(D)	2,229
Radio and TV receiving equipment	365	(D)	(D)	114	4	0	4	13	0	13
Communication equipment	366	(D)	(D)	3,845	48	0	48	(D)	(D)	568
Electronic components	367	(D)	(D)	9,628	(D)	(D)	50	1,207	33	1,174
Other electrical equipment	361–64,369	(D)	(D)	3,473	(D)	(D)	76	(D)	(D)	474
Transportation equipment	37	32,441	13,130	19,311	280	180	100	2,248	548	1,700
Motor vehicles and motor vehicles equipment	371	(D)	(D)	13,590	(D)	(D)	(D)	(D)	(D)	(D)
Other transportation equipment	373–75,379	(D)	(D)	232	(D)	(D)	(D)	(D)	(D)	(D)
Aircraft and missiles	372,376	16,951	11,462	5,489	185	180	5	1,459	406	1,052
Professional and scientific instruments	38	11,976	3,460 (S)	8,516	(D)	(D)	472	(D)	(D)	1,929
Scientific and mechanical measuring instruments	381–82	7,146	3,358 (S)	3,787	(D)	(D)	252	(D)	(D)	1,373
Optical, surgical, photographic, and other instruments	384–87	4,831	102	4,729	(D)	(D)	220	579	23	556
Other manufacturing industries	27,31,39	(D)	(D)	835	(D)	(D)	71	73	0	73

See explanatory information and SOURCE at end of table.

Table B-6. Funds for performance of basic research, applied research, development, funds not distributed, and percent of funds not distributed, by industry, size of company, and source of funds: 1995

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Industry and size of company	SIC code	Total			Basic research			Applied research		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]								
Distribution by industry:										
Nonmanufacturing		$32,036	$4,620	$27,415	$2,006	$304	$1,702	$6,316	$1,150	$5,166
Transportation and utilities	40–42,44–49	5,435	252	5,183	(D)	(D)	106	(D)	(D)	938
Communications	48	(D)	(D)	4,756	(D)	0	(D)	(D)	0	(D)
Telephone communications	481	(D)	(D)	4,697	(D)	0	(D)	(D)	0	(D)
Other communications	482–484,489	59	0	59	(D)	0	(D)	(D)	0	(D)
Electric, gas, and sanitary services	49	440	93	347	(D)	(D)	43	(D)	(D)	93
Other transportation and utilities	40–42,44–47	(D)	(D)	80	(D)	0	(D)	(D)	(D)	(D)
Trade	50–59	(D)	(D)	7,514	(D)	(D)	207	(D)	(D)	1,213
Finance, insurance, and real estate	60–65,67	(D)	(D)	710	(D)	(D)	115	(D)	(D)	16
Services	701,72,73,75–81, 83,84,87,89	17,876	4,270	13,606	1,537	294	1,243	3,979	1,129	2,850
Business services	73	9,293	612	8,681	(D)	(D)	(D)	(D)	(D)	(D)
Computer and data processing services	737	9,059	514	8,545	(D)	(D)	550	(D)	(D)	1,338
Other business services	731–736,738	234	98	136	(D)	(D)	(D)	(D)	(D)	(D)
Health services	80	756	4	753	(D)	(D)	(D)	237	3	235
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	(D)	(D)	737	(D)	(D)	(D)	(D)	(D)	(D)
Other health services	802–805,808–809	(D)	(D)	16 (S)	1	(D)	(D)	(D)	(D)	(D)
Engineering and management services	87	7,662	3,650	4,011	(D)	(D)	(D)	(D)	(D)	(D)
Engineering, architectural, and surveying	871	2,933	1,883	1,050	(D)	(D)	(D)	(D)	(D)	(D)
Research, development, and testing	873	(D)	(D)	2,829	(D)	(D)	(D)	(D)	(D)	(D)
Other engineering and management services	872,874	(D)	(D)	132	(D)	(D)	7	(D)	(D)	0
Other services	701,72,75–79,81, 83,84,89	165	4	160	(D)	(D)	(D)	29	3	26
Other nonmanufacturing industries	07–12,14,15, 161–162,17	413	11	402	31	0	31	(D)	(D)	148

See explanatory information and SOURCE at end of table.

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Table B-6. Funds for performance of basic research, applied research, development, funds not distributed, and [illegible] percent of funds not distributed, by industry, size of company, and source of funds: 1995

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Industry and size of company	SIC code	Total Total	 Federal	 Company	Basic research Total	 Federal	 Company	Applied research Total	 Federal	 Company
		[Dollars in millions]								
Distribution by size of company: [Number of employees]										
Total		$132,103	$23,451	$108,652	$5,093	$511	$4,581	$22,470	$2,725	$19,744
Fewer than 500		16,662	1,978	14,684	1,872	272	1,600	4,457	789	3,668
500 to 999		4,693	225	4,468	(D)	(D)	266	(D)	(D)	1,121
1,000 to 4,999		16,960	798	16,162	1,263	26 (S)	1,237	3,220	42	3,177
5,000 to 9,999		9,532	243	9,289	(D)	(D)	187	2,203	60 (S)	2,143
10,000 to 24,999		17,071	1,946 (S)	15,125	559	3	556	(D)	(D)	2,351
25,000 or more		67,185	18,261	48,924	922	186	736	8,638	1,354	7,284

See explanatory information and SOURCE at end of table.

Table B-8. Funds for performance of basic research, applied research, development, funds not distributed, and percent of funds not distributed, by industry, size of company, and source of funds: 1995

Industry and size of company	SIC code	Development			Expenditures not distributed			Percent of expenditures not distributed		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]						[Percent]		
All Industries		$83,616	$14,679	$68,938	$20,925	$5,536	$15,388	16.0%	24.0%	14.0%
Distribution by industry:										
Manufacturing		62,201	12,746	49,455	18,626	4,302	14,324	19.0	23.0	18.0
Food, kindred, and tobacco products	20,21	803	0	803	174	0	174	11.0	0.0	11.0
Textiles and apparel	22,23	(D)	(D)	228	(D)	(D)	94	(D)	(D)	25.0
Lumber, wood products, and furniture	24,25	(D)	(D)	136	(D)	(D)	45	(D)	(D)	20.0
Paper and allied products	26	345	0	345	(D)	(D)	310	(D)	(D)	22.0
Chemicals and allied products	28	7,936	186 (S)	7,750	(D)	(D)	4,013	(D)	(D)	23.0
Industrial chemicals	281–82,286	(D)	(D)	2,619	(D)	(D)	903	(D)	(D)	18.0
Drugs and medicines	283	4,018	7	4,011	2,994	0	2,994	29.0	0.0	29.0
Other chemicals	284–85,287–89	(D)	(D)	1,119	(D)	(D)	117	(D)	(D)	6.0
Petroleum refining and extraction	13,29	(D)	(D)	669	(D)	0	478 (D)	(D)	0.0	(D)
Rubber products	30	(D)	(D)	753	(D)	(D)	228	(D)	(D)	19.0
Stone, clay, and glass products	32	(D)	(D)	249	41	0	41 (D)	9.0	0.0	9.0
Primary metals	33	(D)	(D)	236	(D)	(D)	179	(D)	(D)	31.0
Ferrous metals and products	331–32,3398–99	(D)	(D)	108	(D)	(D)	19 (D)	(D)	(D)	(D)
Nonferrous metals and products	333–36	130	2	128	(D)	(D)	160 (D)	45.0	64.0	(D)
Fabricated metal products	34	(D)	(D)	654	(D)	(D)	95	(D)	(D)	10.0
Machinery	35	6,209	48	6,162	(D)	(D)	1,168	12.0	10.0	12.0
Office, computing, and accounting machines	357	(D)	(D)	3,111 (S)	(D)	(D)	339	(D)	(D)	7.0
Other machinery, except electrical	351–56,358–59	(D)	(D)	3,051	(D)	(D)	829	(D)	(D)	17.0
Electrical equipment	36	9,689	446	9,243	(D)	(D)	5,410	(D)	(D)	32.0
Radio and TV receiving equipment	365	(D)	(D)	78	(D)	(D)	18	(D)	(D)	16.0
Communication equipment	366	3,119	52	3,067	(D)	(D)	162 (D)	14.0	90.0	(D)
Electronic components	367	3,820	13	3,807	(D)	(D)	4,598 (D)	50.0	92.0	(D)
Other electrical equipment	361–64,369	(D)	(D)	2,292	(D)	(D)	631	16.0	0.0	18.0
Transportation equipment	37	25,250	9,192	16,057	4,663	3,211	1,453	14.0	24.0	8.0
Motor vehicles and motor vehicles equipment	371	(D)	(D)	12,807	(D)	(D)	83	(D)	(D)	1.0
Other transportation equipment	373–75,379	(D)	(D)	118	(D)	(D)	72	14.0	1.0	31.0
Aircraft and missiles	372,376	10,802	7,669	3,133	4,504	3,206	1,298	27.0	28.0	24.0
Professional and scientific instruments	38	8,384	2,795 (S)	5,589	(D)	(D)	526	(D)	(D)	6.0
Scientific and mechanical measuring instruments	381–82	(D)	(D)	2,052	(D)	(D)	110 (S)	(D)	(D)	3.0
Optical, surgical, photographic, and other instruments	384–87	(D)	(D)	3,537	(D)	(D)	416	(D)	(D)	9.0
Other manufacturing industries	27,31,39	581	0	581	(D)	(D)	110	(D)	(D)	13.0

See explanatory information and SOURCE at end of table.

Table B-8. Funds for performance of basic research, applied research, development, funds not distributed, and percent of funds not distributed, by industry, size of company, and source of funds: 1995

Industry and size of company	SIC code	Development			Expenditures not distributed			Percent of expenditures not distributed		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]						[Percent]		
Distribution by industry:										
Nonmanufacturing		$21,415	$1,932	$19,483	$2,299	$1,234	$1,065	7.0%	27.0%	4.0%
Transportation and utilities	40–41,44–49	4,285	232	4,053	(D)	(D)	85	(D)	(D)	2.0
Communications	48	(D)	(D)	3,849	(D)	0	(D)	0.0	0.0	0.0
Telephone communications	481	(D)	(D)	3,809	0	0	0	0.0	0.0	0.0
Other communications	482–484,489	41	0	41	(D)	0	(D)	(D)	0.0	(D)
Electric, gas, and sanitary services	49	250	86	163	(D)	0	48	11.0	0.0	14.0
Other transportation and utilities	40–42,44–47	(D)	(D)	40	(D)	(D)	(D)	51.0	100.0	(D)
Trade	50–59	(D)	(D)	5,956	(D)	(D)	139	(D)	(D)	2.0
Finance, insurance, and real estate	60–65,67	(D)	(D)	575	(D)	(D)	4	(D)	(D)	1.0
Services	701,72,73,75–81, 83,84,87,89	10,315	1,626	8,690	2,045	1,221	823	11.0	29.0	6.0
Business services	73	6,691	258	6,434	(D)	(D)	(D)	(D)	(D)	(D)
Computer and data processing services	737	6,533	178	6,355	(D)	(D)	301	(D)	(D)	4.0
Other business services	731–736,738	158	80	78	(D)	0	(D)	(D)	0.0	(D)
Health services	80	(D)	(D)	(D)	0	0	0	0.0	0.0	0.0
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	(D)	(D)	(D)	0	0	0	0.0	0.0	0.0
Other health services	802–805,808–809	7	0	7	0	0	0	0.0	0.0	0.0
Engineering and management services	87	3,031	1,367 (S)	1,664	(D)	(D)	498	(D)	(D)	12.0
Engineering, architectural, and surveying	871	799	482	317	(D)	(D)	(D)	(D)	(D)	(D)
Research, development, and testing	873	(D)	(D)	1,222	(D)	(D)	(D)	6.0	7.0	(D)
Other engineering and management services	872,874	(D)	(D)	125	0	0	0	0.0	0.0	0.0
Other services	701,72,75–79,81, 83,84,89	(D)	(D)	(D)	(D)	0	(D)	(D)	0.0	(D)
Other nonmanufacturing industries	07–12,14,15, 161–162,17	(D)	(D)	209	13	0	13	3.0	0.0	3.0

See explanatory information and SOURCE at end of table.

Table B-8. Funds for performance of basic research, applied research, development, funds not distributed, and percent of funds not distributed, by industry, size of company, and source of funds: 1995

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Industry and size of company	SIC code	Development			Expenditures not distributed			Percent of expenditures not distributed		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]						[Percent]		
Distribution by size of company: [Number of employees]										
Total		$83,616	$14,679	$68,938	$20,925	$5,536	$15,388	16.0%	24.0%	14.0%
Fewer than 500		9,406	847	8,559	926	69	857	6.0	3.0	6.0
500 to 999		2,907	156	2,751	(D)	(D)	330 (S)	(D)	(D)	7.0
1,000 to 4,999		10,617	633	9,984	1,860	96	1,764	11.0	12.0	11.0
5,000 to 9,999		6,444	153 (S)	6,291	(D)	(D)	669	(D)	(D)	7.0
10,000 to 24,999		10,386	1,377 (S)	9,009	(D)	(D)	3,209	(D)	(D)	21.0
25,000 or more		43,856	11,513	32,343	13,768	5,208	8,560	20.0	29.0	17.0

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1995

Table B-9. Funds for performance of basic research, applied research, development, funds not distributed, and percent of funds not distributed, by industry, size of company, and source of funds: 1995

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Industry and size of company	SIC code	Total			Basic research			Applied research		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]								
All Industries		$144,667	$23,653	$121,015	$7,011	$1,114	$5,897	$24,386	$3,013	$21,373
Distribution by industry:										
Manufacturing		111,864	20,020	91,845	(D)	(D)	3,948	(D)	(D)	15,714
Food, kindred, and tobacco products	20,21	1,564	0	1,564	87	0	87	443	0	443
Textiles and apparel	22,23	(D)	(D)	414	37	0	37	(D)	(D)	32
Lumber, wood products, and furniture	24,25	(D)	(D)	634	29	0	29	(D)	(D)	94
Paper and allied products	26	(D)	(D)	1,534	255 (S)	0	255 (S)	(D)	(D)	567 (S)
Chemicals and allied products	28	(D)	(D)	17,520	1,322	8	1,314	(D)	(D)	4,651
Industrial chemicals	281–82,286	(D)	(D)	5,246	(D)	(D)	599	(D)	(D)	1,260
Drugs and medicines	283	9,773	3	9,769	(D)	(D)	651	(D)	(D)	2,401
Other chemicals	284–85,287–89	2,505	0	2,505	64	0	64	991	0	991
Petroleum refining and extraction	13,29	1,654	24	1,630	(D)	(D)	(D)	416	2	414
Rubber products	30	(D)	(D)	1,269	(D)	(D)	55	(D)	(D)	188
Stone, clay, and glass products	32	468	5	463	(D)	(D)	19	(D)	(D)	148
Primary metals	33	(D)	(D)	637	(D)	(D)	(D)	(D)	(D)	138
Ferrous metals and products	331–32,3398–99	(D)	(D)	214	5	(D)	(D)	(D)	0	(D)
Nonferrous metals and products	333–36	(D)	(D)	422	(D)	0	(D)	(D)	(D)	(D)
Fabricated metal products	34	(D)	(D)	1,322	(D)	(D)	86	(D)	(D)	152
Machinery	35	13,455	117	13,338	(D)	(D)	337	(D)	(D)	2,150
Office, computing, and accounting machines	357	(D)	(D)	8,132	(D)	(D)	59	(D)	(D)	1,498
Other machinery, except electrical	351–56,358–59	(D)	(D)	5,206	(D)	(D)	278	(D)	(D)	653
Electrical equipment	36	22,498	2,143	20,356	(D)	(D)	443	(D)	(D)	3,389
Radio and TV receiving equipment	365	(D)	(D)	140	21	(D)	(D)	(D)	0	(D)
Communication equipment	366	(D)	(D)	4,359	(D)	(D)	59	(D)	(D)	662
Electronic components	367	(D)	(D)	12,497	(D)	(D)	(D)	2,665	(D)	(D)
Other electrical equipment	361–64,369	(D)	(D)	3,360	(D)	(D)	217	(D)	(D)	545
Transportation equipment	37	32,737	12,202	20,535	(D)	(D)	190	(D)	(D)	1,992
Motor vehicles and motor vehicles equipment	371	(D)	(D)	14,528	103	(D)	(D)	(D)	(D)	(D)
Other transportation equipment	373–75,379	(D)	(D)	298	(D)	0	(D)	86	(D)	(D)
Aircraft and missiles	372,376	16,224	10,515	5,710	(D)	(D)	(D)	(D)	(D)	(D)
Professional and scientific instruments	38	12,149	3,942	8,207	(D)	(D)	789	934	52	882
Scientific and mechanical measuring instruments	381–82	(D)	(D)	3,283	(D)	(D)	315	333	18	315
Optical, surgical, photographic, and other instruments	384–87	(D)	(D)	4,924	(D)	(D)	474	600	34	567
Other manufacturing industries 1/	27,31,39	(D)	(D)	2,423	(D)	(D)	234	924	451	473

See explanatory information and SOURCE at end of table.

Table B-4. Funds for performance of basic research, applied research, development, funds not distributed, and percent of funds not distributed, by industry, size of company, and source of funds: 1996

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Industry and size of company	SIC code	Total: Total	Total: Federal	Total: Company	Basic research: Total	Basic research: Federal	Basic research: Company	Applied research: Total	Applied research: Federal	Applied research: Company
		[Dollars in millions]								
Distribution by industry:										
Nonmanufacturing		$32,803	$3,633	$29,170	(D)	(D)	$1,949	(D)	(D)	$5,659
Transportation and utilities	40–42,44–49	4,678	186	4,492	(D)	(D)	(D)	(D)	(D)	(D)
Communications	48	(D)	(D)	3,970	(D)	0	(D)	(D)	(D)	(D)
Telephone communications	481	(D)	(D)	3,897	(D)	0	(D)	(D)	(D)	(D)
Other communications	482–484,489	73	0	73	(D)	0	(D)	16	(D)	(D)
Electric, gas, and sanitary services	49	352	42	311	14	0	14	(D)	(D)	73
Other transportation and utilities	40–42,44–47	(D)	(D)	211	(D)	(D)	(D)	(D)	0	(D)
Trade	50–59	6,389	51 (S)	6,338	(D)	(D)	391	1,462	0	1,462
Finance, insurance, and real estate	60–65,67	(D)	(D)	1,280	12	(D)	(D)	(D)	0	(D)
Services	701,72,73,75–81, 83,84,87,89	19,022	3,118	15,904	1,618	306	1,312	3,952	1,006 (S)	2,946
Business services	73	10,641	361	10,280	550	48	501	1,328	51	1,277
Computer and data processing services	737	(D)	(D)	10,025	510	48	461	(D)	(D)	1,244
Other business services	731–736,738	(D)	(D)	255	40	0	40	(D)	(D)	33
Health services	80	(D)	(D)	735 (S)	(D)	(D)	51	(D)	(D)	252 (S)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	715 (S)	3	713 (S)	48	(D)	(D)	(D)	(D)	(D)
Other health services	802–805, 808–809	(D)	(D)	23	(D)	0	(D)	12	(D)	(D)
Engineering and management services	87	7,318	2,746	4,572	992	256	735	2,324	949 (S)	1,376
Engineering, architectural, and surveying	871	1,660	994	667	(D)	(D)	(D)	(D)	(D)	(D)
Research, development, and testing	873	5,484	1,708 (S)	3,776	762	114	648	1,772	603 (S)	1,168
Other engineering and management services	872,874	173	45	129	(D)	(D)	(D)	(D)	(D)	(D)
Other services	701,72,75–79,81, 83,84,89	(D)	(D)	317	(D)	(D)	24	(D)	(D)	42
Other nonmanufacturing industries 1/	07–12,14,15, 161–162,17	(D)	(D)	1,156	44	0	44	547	218	329

See explanatory information and SOURCE at end of table.

Table B-9. Funds for performance of basic research, applied research, development, funds not distributed, and percent of funds not distributed, by industry, size of company, and source of funds: 1996

Industry and size of company	SIC code	Total			Basic research			Applied research		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]								
Distribution by size of company: [Number of employees]										
Total		$144,667	$23,653	$121,015	$7,011	$1,114	$5,897	$24,386	$3,013	$21,373
Fewer than 500		20,249	2,301	17,948	2,075	231	1,844	5,264	1,159	4,105
500 to 999		4,637	219	4,418	(D)	(D)	443	(D)	(D)	1,080
1,000 to 4,999		18,273	512	17,761	1,355	78	1,277	3,597	59	3,538
5,000 to 9,999		11,537	468	11,068	(D)	(D)	353	2,160	168	1,992
10,000 to 24,999		20,164	1,031 (S)	19,133	1,136	3 (S)	1,133	3,613	63 (S)	3,550
25,000 or more		69,808	19,122	50,686	(D)	(D)	847	(D)	(D)	7,108

See explanatory information and SOURCE at end of table.

Table B-9. Funds for performance of basic research, applied research, development, funds not distributed, and percent of funds not distributed, by industry, size of company, and source of funds: 1996

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Industry and size of company	SIC code	Development			Expenditures not distributed			Percent of expenditures not distributed		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]						[Percent]		
All Industries		$91,852	$14,420 (S)	$77,434	$21,418	$5,106	$16,311	14.8%	21.6%	13.5%
Distribution by industry:										
Manufacturing		69,607	12,741	56,868	20,004	4,689	15,315	17.9	23.4	16.7
Food, kindred, and tobacco products	20,21	835	0	835	199	0	199	12.7	0.0	12.7
Textiles and apparel	22,23	(D)	(D)	236	(D)	(D)	109	26.2	0.0	26.3
Lumber, wood products, and furniture	24,25	371	0	371	(D)	(D)	140	21.9	9.1	22.1
Paper and allied products	26	(D)	(D)	420	(D)	(D)	292	18.5	0.0	19.0
Chemicals and allied products	28	(D)	(D)	8,297	(D)	(D)	(D)	18.1	0.0	(D)
Industrial chemicals	281-82,286	(D)	(D)	2,590	(D)	(D)	(D)	13.9	0.0	(D)
Drugs and medicines	283	4,379	2 (S)	4,376	2,341	0	2,341	24.0	0.0	24.0
Other chemicals	284-85,287-89	1,329	0	1,329	121	0	121	4.8	0.0	4.8
Petroleum refining and extraction	13,29	(D)	(D)	(D)	(D)	0	(D)	(D)	0.0	(D)
Rubber products	30	(D)	(D)	780	(D)	(D)	246	17.7	0.0	19.4
Stone, clay, and glass products	32	(D)	(D)	255	41	0	41	8.8	0.0	8.9
Primary metals	33	598 (S)	(D)	(D)	190	(D)	(D)	20.0	1.0	(D)
Ferrous metals and products	331-32,3398-99	(D)	(D)	(D)	(D)	0	(D)	(D)	0.0	(D)
Nonferrous metals and products	333-36	(D)	(D)	176	(D)	(D)	(D)	22.7	1.0	(D)
Fabricated metal products	34	(D)	(D)	594	(D)	(D)	490	38.7	75.0	37.1
Machinery	35	9,412	67	9,345	(D)	(D)	1,506	(D)	(D)	11.3
Office, computing, and accounting machines	357	(D)	(D)	5,920	(D)	(D)	655	8.0	0.0	8.1
Other machinery, except electrical	351-56,358-59	(D)	(D)	3,424	(D)	(D)	851	16.3	13.6	16.3
Electrical equipment	36	11,075	316	10,761	(D)	(D)	5,763	(D)	(D)	28.3
Radio and TV receiving equipment	365	(D)	(D)	102	(D)	0	(D)	5.0	0.0	(D)
Communication equipment	366	3,466	30	3,437	(D)	(D)	201	13.3	92.7	4.6
Electronic components	367	4,869	47	4,822	(D)	(D)	(D)	44.5	59.5	(D)
Other electrical equipment	361-64,369	(D)	(D)	2,401	(D)	(D)	197	5.3	0.0	5.9
Transportation equipment	37	25,833	9,225 (S)	16,607	3,509	1,763	1,746	10.7	14.4	8.5
Motor vehicles and motor vehicles equipment	371	(D)	(D)	13,673	(D)	(D)	(D)	0.5	0.0	0.6
Other transportation equipment	373-75,379	(D)	(D)	82	(D)	(D)	(D)	48.4	51.1	(D)
Aircraft and missiles	372,376	10,682	7,830 (S)	2,852	3,153	1,628	1,525	19.4	15.5	26.7
Professional and scientific instruments	38	(D)	(D)	5,834	(D)	(D)	702	(D)	(D)	8.6
Scientific and mechanical measuring instruments	381-82	(D)	(D)	2,089	(D)	(D)	564	30.9	42.7	17.2
Optical, surgical, photographic, and other instruments	384-87	(D)	(D)	3,745	(D)	(D)	138	2.8	3.6	2.8
Other manufacturing industries 1/	27,31,39	1,650	79	1,571	(D)	(D)	145	5.1	0.9	6.0

See explanatory information and SOURCE at end of table.

Table B-8. Funds for performance of basic research, applied research, development, funds not distributed, and percent of funds not distributed, by industry, size of company, and source of funds: 1996

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Industry and size of company	SIC code	Development			Expenditures not distributed			Percent of expenditures not distributed		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]						[Percent]		
Distribution by industry:										
Nonmanufacturing		$22,245	$1,679 (S)	$20,566	$1,414	$418 (S)	$996	4.3%	11.5%	3.4%
Transportation and utilities	40–41,44–49	3,560	164	3,395	(D)	(D)	78	(D)	(D)	1.7
Communications	48	(D)	(D)	3,038	(D)	0	(D)	(D)	0.0	(D)
Telephone communications	481	(D)	(D)	2,982	0	0	0	0.0	0.0	0.0
Other communications	482–484,489	(D)	(D)	55	(D)	0	(D)	(D)	0.0	(D)
Electric, gas, and sanitary services	49	(D)	(D)	190	34	0	34	9.7	0.0	10.9
Other transportation and utilities	40–42,44–47	163	0	163	58	(D)	(D)	(D)	100.0	(D)
Trade	50–59	(D)	(D)	4,262	223	0	223	3.5	0.0	3.5
Finance, insurance, and real estate	60–65,67	1,171	0	1,171	(D)	(D)	(D)	0.5	100.0	(D)
Services	701,72,73,75–81, 83,84,87,89	12,417	1,458 (S)	10,959	1,035 (S)	348 (S)	687 (S)	5.4	11.2	4.3
Business services	73	7,993	114	7,879	770 (S)	148	623 (S)	7.2	41.0	6.1
Computer and data processing services	737	(D)	(D)	7,706	(D)	148	(D)	7.3	(D)	(D)
Other business services	731–736,738	(D)	(D)	173	(D)	0	(D)	3.3	0.0	(D)
Health services	80	(D)	(D)	431 (S)	(D)	0	(D)	(D)	0.0	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs	801,806,807	(D)	(D)	(D)	(D)	0	(D)	(D)	0.0	(D)
Other health services	802–805, 808–809	(D)	0	(D)	0	0	0	0.0	0.0	0.0
Engineering and management services	87	3,738	1,340 (S)	2,397	264 (S)	201 (S)	64	3.6	7.3	1.4
Engineering, architectural, and surveying	871	913	530	384	(D)	(D)	(D)	(D)	(D)	(D)
Research, development, and testing	873	2,725	810 (S)	1,915	225 (S)	181 (S)	45	4.1	10.6	1.2
Other engineering and management services	872,874	98	1	97	(D)	(D)	(D)	(D)	(D)	(D)
Other services	701,72,75–79,81, 83,84,89	(D)	(D)	251	(D)	0	(D)	(D)	0.0	(D)
Other nonmanufacturing industries 1/	07–12,14,15, 161–162,17	(D)	(D)	778	(D)	(D)	(D)	4.0	18.5	(D)

See explanatory information and SOURCE at end of table.

Table B-9. Funds for performance of basic research, applied research, development, funds not distributed, and percent of funds not distributed, by industry, size of company, and source of funds: 1996

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Industry and size of company	SIC code	Development			Expenditures not distributed			Percent of expenditures not distributed		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]						[Percent]		
Distribution by size of company: [Number of employees]										
Total		$91,852	$14,420 (S)	$77,434	$21,418	$5,106	$16,311	14.8%	21.6%	13.5%
Fewer than 500		11922	726	11197	988	185	802	4.9	8.0	4.5
500 to 999		2603	123	2480	(D)	(D)	415 (S)	(D)	(D)	9.4
1,000 to 4,999		11754	250	11504	1567	125 (S)	1442	8.6	24.4	8.1
5,000 to 9,999		8171	289	7881	(D)	(D)	842	(D)	(D)	7.6
10,000 to 24,999		11645	665 (S)	10980	3770	300	3470	18.7	29.1	18.1
25,000 or more		45758	12368 (S)	33392	13805	4464	9341	19.8	23.3	18.4

1/ Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" for 1996 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Industrial Research and Development: 1996

COMPARABILITY OF STATISTICS

This section summarizes the survey procedures and practices that may have affected the comparability of statistics produced from the Survey of Industrial Research and Development over time and with other statistical series.[9]

REVISIONS TO HISTORICAL AND IMMEDIATE PRIOR-YEAR STATISTICS

Changes to historical statistics usually have been made because of changes in the industry classification of companies caused by changes in payroll composition detected when a new sample was drawn. Various methodologies have been adopted over the years to revise, or backcast, the data when revisions to historical statistics have become necessary. Documented revisions to the historical statistics from post-1967 surveys are summarized in *Research and Development in Industry: 1991* (NSF 94-325). Detailed descriptions of the specific revisions made to the statistics from pre-1967 surveys are scarce. However, summaries of some of the major revisions are included in the technical paper cited below.[10]

Routine revision of previously published immediate prior-year statistics was discontinued beginning with the 1995 survey. The practice throughout the history of the survey was to use results from the current-year survey not only to develop current-year statistics, but also to revise immediate prior-year statistics. Changes to reported data can came from three sources: respondents, analysts involved in survey and statistical processing, and the industry reclassification process. Because of annual sampling, the continual strengthening of sampling methodology, and improvements in data verification, processing, and nonresponse follow-up, and because it is not clear that respondents or those who processed the survey results had any better information than they had when the data were first reported, it was determined that routinely revising published survey statistics increased the potential for error and often confused users of the statistics. For these reasons, the systematic revision of immediate prior-year statistics was discontinued. Now revisions are made to historical and immediate prior-year statistics only if egregious errors are discovered.

YEAR-TO-YEAR CHANGES

Comparability from year-to-year may be affected by new sample design, annual sample selection, and industry shifts.

SAMPLE DESIGN

Changes to the sample design can affect comparability of year-to-year estimates. By far the most profound influence on statistics from recent surveys occurred when the new sample design for the 1992 survey was introduced. Revisions to the 1991 statistics were dramatic (see *Research and Development in Industry: 1992* for a detailed discussion). While the allocation of the sample was changed somewhat, the sample designs used for the 1993-96 surveys were comparable in terms of size and coverage to the 1992 sample design.

ANNUAL SAMPLE SELECTION

With the introduction of annual sampling in 1992, more year-to-year change has resulted than when survey panels were used. There are two reasons why this is so. First, changes in classification of companies not surveyed were not reflected in the year-to-year movement. Prior to annual sampling, the wedging operation, which was performed when a new sample was selected, was a means of adjusting the data series to account for the changes in classification that occurred in the frame (see the discussion on wedging below). Second, yearly correlation of R&D data is lost when independent samples are drawn each year.

INDUSTRY SHIFTS

The industry classification of companies is redefined each year with the creation of the sampling frame. By redefining the frame, the sample reflects current distributions of companies by size and industry. During this process, a company may move from one industry into another because of several factors: changes in a company's payroll composition, which is used to determine the industry classification code (see discussion above under "Frame Creation"); changes in the industry classification system itself; or changes in the way the industry classification code is assigned or revised during survey processing.

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[9] See also the technical paper U.S. Department of Commerce, Bureau of the Census, *Documentation of the Survey Design for the Survey of Industrial Research and Development: A Historical Perspective* (Washington, DC, 1995).

[10] U.S. Department of Commerce, Bureau of the Census, *Survey Design of the Survey of Industrial Research and Development: A Historical Perspective* (Washington, DC, 1995).

A company's payroll composition changes because of a number of events. Among them are (1) the growth or decline of product or service lines; (2) the merger of two or more companies; (3) the acquisition of one company by another; (4) divestitures; or (5) the formation of conglomerates. Since the introduction of annual sampling in 1992, although this is unlikely, a company's industry designation can be reclassified yearly. The result is that a downward movement in R&D expenditures in one industry is balanced by an upward movement in another industry from one year to the next.

From time to time, the SIC coding system, which is used by most Federal Government agencies that publish industry statistics, is revised to reflect the changing composition of U.S. industry. For statistics developed for 1988–91 from the 1988–91 surveys, companies retained the industry classifications assigned for the 1987 sample. These classifications were based on the 1977 SIC system. The last major revision of the SIC system was for 1987. This new system was used to classify companies in the post-1991 surveys.

Finally, the method used to classify firms during survey processing was revised slightly in 1992. Research has shown that the impact on individual industry estimates has been minor.[11] The current method used to classify firms is discussed above under "Frame Creation." Methods used for past surveys are discussed in the technical paper cited below.[12]

CAPTURING SMALL AND NONMANUFACTURING R&D PERFORMERS[13]

Before the 1992 survey, the sample of firms surveyed was selected at irregular intervals.[14] In intervening years, a panel of the largest firms known to perform R&D was surveyed. For example, a sample of about 14,000 firms was selected for the 1987 survey. For the 1988 through 1991 studies, about 1,700 of these firms were annually resurveyed; the other firms did not receive another questionnaire and their R&D data were estimated. This sample design was adequate during the early years of the survey because the performance of R&D remained concentrated in relatively few manufacturing industries. However, as more and more firms began entering the R&D-performing arena, the old sample design proved increasingly deficient because it did not capture births of new R&D-performing firms. The entry of fledgling R&D performers into the marketplace was simply missed during panel years. Additionally, beginning in the early 1970's, the need for more detailed R&D information for nonmanufacturers was recognized. At that time, the broad industry classifications "miscellaneous business services, and miscellaneous services" were added to the list of industry groups for which statistics were published. By 1975, about 3 percent of total R&D was performed by firms in nonmanufacturing industries.

During the mid-1980's, there was evidence that an increasing number of nonmanufacturing firms were conducting a significant amount of R&D, and again the number of industries used to develop the statistics for nonmanufacturers was increased. Consequently, since 1987 the annual reports in this series have included separate R&D estimates for firms in the communication, utility, engineering, architectural, research, development, testing, computer programming, and data processing service industries; hospitals; and medical labs. Approximately 9 percent of the estimated industrial R&D performance during 1987 was undertaken by nonmanufacturing firms.

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[11] The effects of recent changes in the way companies are classified during survey processing are discussed in detail in the Bureau of the Census technical memoranda entitled "Reclassification of Companies in the 1992 Survey of Industrial Research and Development for the Generation of the 'Analytical' Series," Oct. 25, 1994, and "Comparison of Company Coding Between 1992 and 1993 for the Survey of Industrial Research and Development," Nov. 3, 1994.

[12] U.S. Department of Commerce, Bureau of the Census, *Documentation of the Survey Design for the Survey of Industrial Research and Development: A Historical Perspective* (Washington, DC, 1995).

[13] See also National Science Foundation, *SRS Data Brief*, 1992 R&D Spending by U.S. Firms Rises, NSF Survey Improved (NSF 94-325), (Arlington, VA, Sept. 9, 1994).

[14] During the early years of the survey, until 1967, samples were selected every 5 years. Subsequent samples were selected for 1971, 1976, 1981, and 1987.

After the list of industries for which statistics were published was expanded, it became clear that the sample design itself should be changed to reflect the widening population of R&D performers among firms in the nonmanufacturing industries[15] and small firms in all industries, to account better for births of R&D performing firms and to produce statistics that are generally more reliable. Beginning with the 1992 survey, NSF decided to (1) draw new samples with broader coverage annually, and (2) increase the sample size to approximately 23,000 firms.[16] As a result of the sample redesign, for 1992, the reported nonmanufacturing share was and continues to be estimated at approximately 25 percent of total R&D.

TIME SERIES ANALYSES

As discussed earlier, the statistics resulting from the survey are better indicators of changes in, rather than absolute levels of, R&D spending and personnel. Nevertheless, the statistics are often considered as a continuous time series that has been prepared using the same collection, processing, and tabulation methods. Such uniformity during preparation has not been the case. Since the survey was first fielded, improvements have been made to increase the reliability of the statistics and to make the survey results more useful. To that end, existing practices have been changed and new procedures have been instituted. Preservation of the comparability of the statistics has been an important consideration when improvements have been made, however. Changes to survey definitions, the industry classification system, and the procedure used to assign industry codes to multi-establishment companies[17] have had some, though not substantial, effects on the comparability of statistics.[18]

The aspect of the survey that had a greater effect on comparability was the selection of samples at irregular intervals (i.e., 1967, 1971, 1976, 1981, 1987, and 1992) and the use of a subset or panel of the last sample drawn to develop statistics for intervening years. As discussed earlier, this practice introduced cyclical deterioration of the statistics. As compensation for this deterioration, periodic revisions have been made to the statistics produced from the panels surveyed between sample years. Early in the survey's history, various methods were used to make these revisions.[19] After 1976 and until 1992 with the advent of annual sampling, a linking procedure called wedging was used.[20] Simply described, in wedging, the 2 sample years on each end of a series of estimates served as benchmarks in the algorithms used to adjust the estimates for the intervening years.

WEDGING METHODOLOGY

For a full discussion of the mathematical algorithm used for the wedging process that linked statistics from the 1992 survey with those from the 1987 survey, see the technical memorandum cited below.[21] In general, the memorandum states that wedging,

> *takes full advantage of the fact that in the first year of a new panel [when a new sample is selected], both current-year and prior-year estimates are derived. Thus, two independent estimates exist for the prior year. The estimates*

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[15] For the 1992 survey, 25 new nonmanufacturing industry and industry groups were added to the sample frame: agricultural services (SIC 07); fishing, hunting, and trapping (09); wholesale trade–nondurables (51); stationery and office supply stores (5112); industrial and personal service paper (5113); groceries and related products (514); chemicals and allied products (516); miscellaneous nondurable goods (519); home furniture, furnishings, and equipment stores (57); radio, TV, consumer electronics, and music stores (573); eating and drinking places (581); miscellaneous retail (59); nonstore retailers (596); real estate (65); holding and other investment offices (67); hotels, rooming houses, camps, and other lodging places (70); automotive repair, services, and parking (75); miscellaneous repair services (76); amusement and recreation services (79); health services (80); offices and clinics of medical doctors (801); offices and clinics of other health practitioners (804); miscellaneous health and allied services not elsewhere classified (809); engineering, accounting, research, management, and related services (87); and management and public relations services (874).

[16] Annual sampling also remedies the cyclical deterioration of the statistics that results from changes in a company's payroll composition because of product line and corporate structural changes.

[17] For discussions for each of these, see the Bureau of the Census technical memorandum entitled "Wedging Considerations for the 1992 Research and Development (R&D) Survey," June 10, 1994.

[18] See the Bureau of the Census technical memoranda entitled "Reclassification of Companies in the 1992 Survey of Industrial Research and Development for the Generation of 'Analytical' Series," Oct. 25, 1994, and "Effects of the 1987 SIC Revision on Company Classification in the Survey of Industrial Research and Development (R&D)," Dec. 6, 1993.

[19] See U.S. Department of Commerce, Bureau of the Census, *Survey Design of the Survey of Industrial Research and Development: A Historical Perspective* (Washington, DC, 1995).

[20] The process was dubbed wedging because of the wedgelike area produced on a graph that compares originally reported statistics with the revised statistics that result after linking.

[21] Bureau of the Census technical memorandum, "Wedging Considerations for the 1992 Research and Development (R&D) Survey," June 10, 1994.

from the new panel are treated as superior primarily because the new panel is based on updated classifications [the industry classifications in the prior panel are frozen] and is more fully representative of the current universe (the prior panel suffers from panel deterioration, especially a lack of birth updating). The limitations in the prior panel caused by these factors are naturally assumed to increase with time, so that in the revised series, we desire a gradual increase in the level or revision over time which culminates in the real difference observed between the two independent sample estimates of the prior year. At the same time, we desire that the annual movement of the original series be preserved to the degree possible in the revised series.

To that end, the wedging algorithm does not change estimates from sample years and adjusts estimates from panel years, recognizing that deterioration of the panel is progressive over time.

WEDGED VERSUS NOT-WEDGED STATISTICS

One of the primary reasons for the decision to select a new sample annually rather than at irregular intervals was to avoid applying global revision processes such as wedging. Consequently, the 1992 survey was intended to be the last one affected by the wedging procedure.

COMPARISONS TO OTHER STATISTICAL SERIES

The NSF collects data on federally financed R&D from both Federal funding agencies and performers of the work (industry, Federal labs, universities, and other nonprofit organizations). As reported by Federal agencies, NSF publishes data on Federal R&D budget authority and outlays, in addition to Federal obligations. These terms are defined below:[22]

- *Budget authority* is the primary source of legal authorization to enter into financial obligations that will result in outlays. Budget authority most commonly is granted in the form of appropriations laws enacted by Congress with the approval of the President.[23]

- *Obligations* represent the amounts for orders placed, contracts awarded, services received, and similar transactions during a given period, regardless of when the funds were appropriated or when future payment of money is required.

- *Outlays* represent the amounts for checks issued and cash payments made during a given period, regardless of when the funds were appropriated or obligated.

For the reasons cited above, national R&D expenditure totals in NSF's *National Patterns of R&D Resources* report series are constructed primarily based on data reported by performers and include estimates of Federal R&D funding to these sectors. But until performer-reported survey data on Federal R&D expenditures are available from industry and academia, data collected from the Federal agency funders of R&D are used to project R&D performance. When survey data from the performers subsequently are tabulated (as they are in this report), these statistics replace the projections based on funder expectations. Historically, the two survey systems have tracked fairly closely. For example, in 1980 performers reported using $29.5 billion in Federal R&D funding, and Federal agencies reported total R&D funding between $29.2 billion in outlays and $29.8 billion in obligations.[24] In recent years, however, the two series have diverged considerably.[25] The difference in the Federal R&D totals appears to be concentrated in funding of industry (primarily aircraft and missile firms) by the Department of Defense. Overall, industrial firms have reported significant declines in Federal R&D support since 1990 (see table A-1), while Federal agencies reported level or slightly increased funding of industrial R&D.[26] NSF is examining the causal factors of these divergent trends.

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[22] See also NSF, *Federal Funds for Research and Development: Fiscal Years 1994–96*, NSF 97-302 (Arlington, VA, 1997)

[23] See NSF, *Federal R&D Funding by Budget Function: Fiscal Years 1994–96* (Budget Function), NSF 95-342 (Arlington, VA, 1995)

[24] NSF, *National Patterns of R&D Resources: 1996*, NSF 96-333 (Arlington, VA, 1996)

[25] Ibid.

[26] Ibid.

SURVEY DEFINITIONS

COST PER R&D SCIENTIST OR ENGINEER

The arithmetic mean of the numbers of full-time-equivalent (FTE) scientists and engineers engaged in the performance of R&D reported for January in 2 consecutive years divided into the total R&D expenditures of the earlier year, with the ratio attributed to the earlier year. For example, the mean of the numbers of FTE R&D scientists and engineers in January 1995 and January 1996 is divided into total 1995 R&D expenditures for a total cost per R&D scientist or engineer in 1995.

EMPLOYMENT, FTE R&D SCIENTISTS AND ENGINEERS

Persons employed by the company during the January following the survey year who are engaged in scientific or engineering work at a level that requires knowledge of engineering or of the physical, biological, mathematical, statistical, or computer sciences equivalent at least to that acquired through completion of a 4-year college program with a major in one of those fields. The statistics in this report show the FTE employment. FTE employment is the number of scientists and engineers in the company who are assigned full time plus a prorated number of employees working part-time on R&D.

EMPLOYMENT, TOTAL

Number of persons domestically employed by R&D-performing companies in all activities during the pay period that includes the 12th of March.

FEDERALLY FUNDED R&D CENTERS (FFRDC'S)

R&D-performing organizations administered by industrial, educational, or other institutions on a nonprofit basis, exclusively or substantially financed by the Federal Government. R&D expenditures of the FFRDC's that are industry-administered are included with the Federal R&D data of the industry classification of each of the administering firms. The industry-administered FFRDC's included in the 1995 and 1996 surveys are listed as follows.

FFRDC's Supported by the Department of Energy:

Energy Technology Engineering Center
Rockwell International Corp.
Canoga Park, CA

Idaho National Engineering Laboratory
Lockheed Martin Corp.
Idaho Falls, ID

Oak Ridge National Laboratory
Lockheed Martin Corp.
Oak Ridge, TN

Sandia National Laboratories
Lockheed Martin Corp.
Albuquerque, NM

Savannah River Laboratory
Westinghouse Corp.
Aiken, SC

FFRDC Supported by the Department of Health and Human Services, National Institutes of Health:

NCI Frederick Cancer Research Facility
Science Applications International Corporation (SAIC)
Advanced Bioscience Laboratories, Inc.
Frederick, MD

FUNDS FOR R&D, COMPANY AND OTHER

The cost of R&D actually performed within the company and funded by the company itself or by other non-Federal sources, not including the cost of R&D supported by companies but contracted to outside organizations such as research institutions, universities and colleges, nonprofit organizations, or, to avoid double-counting, other companies.

FUNDS FOR R&D, FEDERAL

Receipts for R&D performed by the company under Federal R&D contracts or subcontracts and R&D portions of Federal procurement contracts and subcontracts.

FUNDS FOR R&D, TOTAL

Operating expenses incurred by a company in the conduct of R&D in its own laboratories or other company-owned or -operated facilities, including wages and salaries; materials and supplies; property and other taxes; maintenance and repairs; depreciation; and an appropriate share of overhead, not including capital expenditures.

INDUSTRIAL RESEARCH AND DEVELOPMENT

The pursuit of a planned search for new knowledge, whether or not the search has reference to a specific commercial objective, although such investigations may be in fields of present or potential interest to the reporting company (**basic research**); the application of existing knowledge having specific commercial objectives with respect to products or processes (**applied research**); or the application of existing knowledge concerned with translating research findings or other scientific knowledge into products or processes (**development**) by persons trained, either formally or by experience, in engineering or in the physical, biological, mathematical, statistical, or computer sciences and employed by a publicly or privately owned firm engaged in for-profit activity in the United States. Industrial R&D includes the design and development of prototypes and processes and excludes quality control, routine product testing, market research, sales promotion, sales service, other nontechnological activities or routine technical services, and research in the social sciences or psychology.

NET SALES AND RECEIPTS

Dollar values for goods sold or services rendered by R&D-performing companies to customers (outside the company), including the Federal Government, less such items as returns, allowances, freight, charges, and excise taxes. Domestic intracompany transfers and sales by foreign subsidiaries are excluded, but transfers to foreign subsidiaries and export sales to foreign companies are included.

SECTION C. SURVEY DOCUMENTS

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NATIONAL SCIENCE FOUNDATION
4201 WILSON BOULEVARD
ARLINGTON, VIRGINIA 22230

OFFICE OF THE
DIRECTOR

FROM THE DIRECTOR
NATIONAL SCIENCE FOUNDATION

The National Science Foundation requests your company's participation in its 1995 Survey of Industrial Research and Development. This annual survey is the only source of detailed information on U.S. industry's research and development (R&D) performance.

Your company's participation is vital to the accuracy of the resulting information. Because R&D expenditures are concentrated in relatively few companies, a completed response is needed from each surveyed firm -- there is no good substitute for the information that you can provide. Your company can be assured of complete confidentiality. Survey data will be released only in aggregate form so that responses of individual companies cannot be identified.

Survey results will be made available to government and industry officials, researchers, and other interested individuals. If you have questions concerning the operation of this survey, please direct them to the Census Bureau's Environment, Technology, and Innovation Branch on (301) 457-1339. If you would like to receive a copy of the final publication or if you need to speak with someone at NSF, please call Jennifer Gray in the Division of Science Resources Studies on (703) 306-1772.

Sincerely,

Neal Lane

Neal Lane
Director

Enclosures

RD-1-L1
(12-95)

UNITED STATES DEPARTMENT OF COMMERCE
Bureau of the Census
Washington, DC 20233-0001

OFFICE OF THE DIRECTOR

FROM THE DIRECTOR
BUREAU OF THE CENSUS

We have enclosed your company's report form and instructions for the 1995 "Survey of Industrial Research and Development." **Please review the instructions, complete the form, and return it within 60 days.** Federal law requires your responses to four items identified on the form. Your voluntary responses to all other items are needed to assure useful results. This survey can help your business and trade association plan new products and markets, and assist public officials in research funding and tax decisions that affect your industry.

Information you report should cover all your company's domestic operations for calendar year 1995. We recognize that providing this information is a burden and we have worked hard to minimize it. For example, if you do not have book records for any item, **you may provide carefully prepared estimates.** The law that authorizes this survey (Title 13, United States Code) requires that we keep your report in full confidence. Only sworn Census Bureau employees will see your information, and they will use it only for statistical purposes.

We conduct this survey with National Science Foundation (NSF) support. We have enclosed a letter from the Director of the NSF emphasizing the importance and usefulness of the survey. If you have any questions, please telephone my staff on (301) 457–1339. Thank you in advance for your cooperation.

Sincerely,

Martha Farnsworth Riche

Martha Farnsworth Riche

Enclosures

☆ U.S. GOVERNMENT PRINTING OFFICE: 1996 - 750-074/20243

PLEASE RETURN BY: ☐

NOTICE – Your report to the Census Bureau is **confidential** by law (Title 13, U.S. Code). It may be seen only by sworn Census employees and may be used only for statistical purposes. The law also provides that copies retained in your files are immune from legal process.

CENSUS USE ONLY

SURVEY CODE
4001

INDUSTRY CODE

WEIGHT

STATE

ADDRESS

SIC CODE

FORM **RD-1(L)**
(9-20-95)

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
COLLECTING AND COMPILING AGENT FOR
THE NATIONAL SCIENCE FOUNDATION

SURVEY OF INDUSTRIAL RESEARCH AND DEVELOPMENT DURING 1995

In correspondence pertaining to this report refer to this **CENSUS FILE NUMBER (11 digits)** ▶

RETURN TO
Bureau of the Census
1201 East 10th Street
Jeffersonville, IN 47132-0001

Name of person who supplied 1994 data

Data supplied in items 1A and 1B and in item 3A, line 3, columns 4 and 6, for 1995 on this form will satisfy the mandatory reporting requirements. (Title 13, U.S. Code.)

PLEASE READ ENCLOSED INSTRUCTIONS BEFORE COMPLETING THIS FORM.

Please correct any error in name and address, including ZIP Code.

GENERAL INSTRUCTIONS

Please complete this form and return within 60 days in the envelope provided. Make a copy for your records.

THIS REPORT SHOULD COVER YOUR ENTIRE COMPANY, INCLUDING ALL SUBSIDIARIES.

- The phrase **performed within the company** includes the activities of domestic subsidiaries.
- The phrase **foreign subsidiaries** is defined as those subsidiaries located outside of the 50 States and the District of Columbia.

Enter 0 (zero) where appropriate rather than leaving an item blank.

Figures for 1994 are those reported by your company last year. THE FIGURES SHOULD BE REVISED, IF NECESSARY, TO BE COMPARABLE TO 1995 DATA.

Explain any substantial increase or decrease in 1995 figures over 1994 in the "Remarks" section on the back page.

Please report figures in thousands of dollars. Reasonably accurate estimates are acceptable.

Section I – GENERAL COMPANY DATA

Item 1 – SALES AND EMPLOYMENT FOR THE COMPANY

	Domestic net sales and receipts of this company *Report in thousands of dollars*					
	1994			1995		
	B	Mil.	Thou.	Bil.	Mil.	Thou.
A. Domestic net sales and receipts of this company INCLUDE sales of products and services to other companies, individuals, U.S. Government agencies, and foreign countries. EXCLUDE domestic intra-company transfers and sales by foreign subsidiaries.	101			102		

	1994	1995
	Number	Number
B. Total domestic company employment in all activities during the pay period which includes the 12th of March 1995 (Item 1 of I.R.S. Form 941, if one Form 941 was filed for the entire company.)	111	112

Item 2 – NUMBER OF RESEARCH AND DEVELOPMENT SCIENTISTS AND ENGINEERS

Apportion on a full-time equivalent basis. *See page 3 of the instruction booklet for more detail.*	January 1995	January 1996
	Number	Number
A. Federal research and development	503	504
B. Company and other research and development	505	506
C. TOTAL – *Sum of lines 2A and 2B* ⟶	501	502

Item 3 – REPORT COSTS INCURRED FOR RESEARCH AND DEVELOPMENT

	(Report in thousands of dollars)																	
	1994									1995								
	Federal funds (1)			Company and other (2)			Total ((1)+(2)) (3)			Federal funds (4)			Company and other (5)			Total ((4)+(5)) (6)		
A. Within the company	Bil.	Mil.	Thou.	Bil.	Mil.	Thou.	Bil.	Mil.	Thou.	Bil.	Mil.	Thou.	B	Mil.	Thou.	Bil.	M	Thou.
1. Basic research – *If "NONE," please mark (X) here and enter 0 (zero) where appropriate.* ⟶ 300 ☐	301			302			303			304								
2. Applied research and development – **a.** Applied research	311			312			313											
b. Development	321			322			323			324						326		
c. Total – *Sum of lines a and b*	331			332			333			334								
3. Total – *Sum of lines 1 and 2.c.*	341			342			343			344			345			346		
B. Outside the company – Total company funds for research and development activities financed by the company but performed by others outside the company within the United States *(Should be excluded from 3.A.3. above)*				352									355					
C. Foreign – Total company funds for research and development activities performed by foreign subsidiaries or by other organizations outside the United States *(Should be excluded from 3.A.3. and 3.B. above)*				362									365					
D. TOTAL – Company and other funds, except Federal – *Sum of lines 3.A.3., 3.B., and 3.C.* ⟶				372														

Item 4 – COMPANY AND OTHER FUNDS, EXCEPT FEDERAL, FOR RESEARCH AND DEVELOPMENT PERFORMED WITHIN THE COMPANY BUDGETED FOR THE YEAR 1996

	1996		
	B	Mil.	Thou.
(Comparable to the 1995 figure reported in item 3.A.3., column (5).)	401		

Section II – RESEARCH AND DEVELOPMENT PERFORMED WITHIN THE DOMESTIC COMPANY

Item 5 – COSTS INCURRED FOR FEDERAL RESEARCH AND DEVELOPMENT PERFORMED WITHIN THIS COMPANY BY PRINCIPAL GOVERNMENT AGENCY

Allocate the total reported in item 3.A., line 3, column (4), Federal funds, into the following principal agencies:	Key code	1993			1994	1995		
	5	Bil.	M	Thou.		Bil.	M	Thou.
1. Department of Defense	01				NOT ASKED			
2. National Aeronautics and Space Administration	02							
3. Department of Energy	03							
4. Other Federal agencies	04							
5. TOTAL COSTS – *Sum of lines 1 through 4* ⟶	05							

Item 6 – COSTS INCURRED FOR RESEARCH AND DEVELOPMENT PERFORMED WITHIN THIS COMPANY BY MAJOR TYPE OF EXPENSE

Allocate the total reported in item 3.A., line 3, column (6), total company research and development – *Exclude lines 3.B. and 3.C.*	Key code	1993			1994	1995		
	6	Bil.	M	Thou.		Bil.	M	Thou.
1. Wages and salaries of research and development personnel – *Include scientists and engineers, technicians, secretaries, and other personnel.*	01				NOT ASKED			
2. Costs of materials and supplies consumed – *Do not include in this item components, models, and other materials supplied by other research organizations.*	02							
3. Other costs – *Include service and supporting costs, R&D depreciation, and share of overhead.*	03							
4. TOTAL COSTS – *Sum of lines 1 through 3* ⟶	04							

PLEASE CONTINUE ON NEXT PAGE

FORM **RD-1(L) (Items 7-9)**
(9-30-85)

SURVEY OF INDUSTRIAL RESEARCH AND DEVELOPMENT DURING 1985

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
COLLECTING AND COMPILING AGENT FOR
THE NATIONAL SCIENCE FOUNDATION

Refer to this CENSUS FILE NUMBER in any correspondence pertaining to this report

Section II — RESEARCH AND DEVELOPMENT PERFORMED WITHIN THE DOMESTIC COMPANY — Continued

Item 7 — FIELDS OF BASIC RESEARCH PERFORMED WITHIN THIS COMPANY

Allocate the total reported in item 3.A., line 1, column (6), basic research, into the following fields of science and engineering.

	Key code	1985	1984	1986 (2)
	7	Bil. Mil. Thou		Bil. Mil. Thou
1. Chemistry	01		N	
2. Engineering (including metallurgy)	02		O	
3. Geological Sciences	03		T	
4. Mathematics	04			
5. Computer Sciences	05		A	
6. Physics	06		S	
7. Astronomy	07		K	
8. Atmospheric Sciences	08		E	
9. Oceanography	09		D	
10. Biological Sciences	10			
11. Clinical Medical Sciences	11			
12. Other —*Specify*	12			
13. **TOTAL BASIC RESEARCH COSTS — *Sum of lines 1 through 12* ⟶**	13			

Item 8 — APPLIED RESEARCH AND DEVELOPMENT BY PRODUCT CLASS PERFORMED WITHIN THIS COMPANY

Allocate the totals reported as applied research and development in item 3.A., line 2.c., columns (4) and (6), into the following product groups and funding sources. These product groups represent the END PRODUCT for the firm. *See page 7 of the instruction booklet for detailed descriptions of product classes.*

No.	SIC Group	Product class	Key code	1985 Federal funds (1)	1985 Total funds (2)	1984	1986 Federal funds (1)	1986 Total funds (2)
			8	Bil. Mil. Thou	Bil. Mil. Thou		Bil. Mil. Thou	Bil. Mil. Thou
1	20	Food and kindred products	01			N		
2	22	Textile mill products	02			O		
3	24	Lumber and wood products	03			T		
4	26	Paper and allied products	04					
5	281, 286	Industrial inorganic and organic chemicals	05			A		
6	282	Plastics materials and synthetic resins, rubber, and fiber	06			S		
7	283	Drugs	07			K		
8	287	Agricultural chemicals	08			E		
9	Balance of SIC 28 group	Cleaning supplies, toiletries, and paints	09			D		
10	29, 13	Petroleum refining and oil and gas extraction	10					
11	30	Rubber and miscellaneous plastics products	11					
12	31	Leather	12					
13	32	Stone, clay, glass, and concrete products	13					
14	331, 332, 3399	Primary ferrous products	14					
15	Balance of SIC 33 group	Primary and secondary nonferrous metals	15					
16	348	Ordnance, except missiles	16					
17	Balance of 34	Fabricated metal products	17					
18	351	Engines and turbines	18					
19	352	Farm machinery and equipment	19					
20	353	Construction, mining, and materials handling machinery	20					
21	354	Metal working machinery and equipment	21					
22	357	Office, computing, and accounting machines	22					
23	Balance of SIC 35 group	Other machinery, except electrical	23					
24	361	Electric transmission and distribution equipment	24					
25	362	Electrical industrial apparatus	25					
26	365	Radio and television receiving sets, except communication types	26					
27	366	Communications equipment	27					
28	367	Electronic components and accessories	28					
29	Balance of SIC 36 group	Other electrical machinery equipment and supplies	29					
30	371	Motor vehicles and equipment	30					
31	372	Aircraft and parts	31					
32	376	Missiles and space vehicles	32					
33	Balance of SIC 37 group	Other transportation equipment	33					
34	381-2	Scientific and mechanical measuring instruments	34					
35	Balance of SIC 38 group	Optical, surgical, photographic, and other instruments	35					
36	737	Software	36					
37		Other — *Specify*	37					
38	**TOTAL APPLIED RESEARCH AND DEVELOPMENT COSTS — *Sum of lines 1 through 37* ⟶**		38					

Item 9 — COST OF RESEARCH AND DEVELOPMENT PERFORMED WITHIN THIS COMPANY, BY STATE

Allocate the total reported in item 3.A., line 3, columns (4) and (6), by the States in which your various research and development laboratories or facilities are located. Estimate the costs associated with each State. If necessary, you may report up to 10 percent of your total as "Not distributed by State."

Key code	State	1985 Federal funds (1)	1985 Total funds (2)	1984	1986 Federal funds (1)	1986 Total funds (2)
9		Bil. Mil. Thou	Bil. Mil. Thou		Bil. Mil. Thou	Bil. Mil. Thou
01	AL			N		
02	AK			O		
03	AZ			T		
04	AR					
05	CA			A		
06	CO			S		
07	CT			K		
08	DE			E		
09	DC			D		
10	FL					
11	GA					
12	HI					
13	ID					
14	IL					
15	IN					
16	IA					
17	KS					
18	KY					
19	LA					
20	ME					
21	MD					
22	MA					
23	MI					
24	MN					
25	MS					
26	MO					
27	MT			N		
28	NE			O		
29	NV			T		
30	NH					
31	NJ			A		
32	NM			S		
33	NY			K		
34	NC			E		
35	ND			D		
36	OH					
37	OK					
38	OR					
39	PA					
40	RI					
41	SC					
42	SD					
43	TN					
44	TX					
45	UT					
46	VT					
47	VA					
48	WA					
49	WV					
50	WI					
51	WY					
52	*					
53	**TOTAL COSTS — *Sum of lines 1 through 52* ⟶**	953			954	

*Not distributed by State

PLEASE CONTINUE ON NEXT PAGE

FORM **RD-1(L)(Items 10–14)**
(9-20-95)

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
COLLECTING AND COMPILING AGENT FOR
THE NATIONAL SCIENCE FOUNDATION

SURVEY OF INDUSTRIAL RESEARCH AND DEVELOPMENT DURING 1995

Refer to this CENSUS FILE NUMBER in any correspondence pertaining to this report

Section II – RESEARCH AND DEVELOPMENT PERFORMED WITHIN THE DOMESTIC COMPANY – Continued

Item 10 – ENERGY RESEARCH AND DEVELOPMENT PERFORMED WITHIN THIS COMPANY

- **Report expenditures for energy research and development by type of energy sources. Include the project cost or portion of project cost incurred for the purpose of increasing energy resources or capabilities. These expenditures should be included in item 3.A., line 3, columns (4) and (6).**
- **Estimate expenditures for energy research by energy source for 1996.**

			Key code	1994						1995						1996					
				Federal funds			Total funds			Federal funds			Total funds			Projected Federal funds			Projected total funds		
				(1)			(2)			(1)			(2)			(3)			(4)		
			10	Bil.	Mil.	Thou.	Bil.	Mil.	Thou.	Bil.	Mil.	Thou.	Bil.	Mil.	Thou.	Bil.	Mil.	Thou.	Bil.	Mil.	Thou.
A. Nuclear	1. Fission		01																		
	2. Fusion		02																		
	3. Total		03																		
B. Fossil fuels	1. Oil		04																		
	2. Gas		05																		
	3. Shale		06																		
	4. Coal	a. Synthetic fuels	07																		
		b. Mining	08																		
		c. All other	09																		
		d. Total coal	10																		
	5. Other fossil fuels		11																		
	6. Total		12																		
C. Geothermal, solar, conservation and utilization	1. Geothermal		13																		
	2. Solar		14																		
	3. Conservation and utilization		15																		
	4. Total		16																		
D. All other energy			17																		
E. TOTAL – *Sum of lines A through D* →			18																		

Item 11 – POLLUTION ABATEMENT RESEARCH AND DEVELOPMENT PERFORMED WITHIN THIS COMPANY

- **Report expenditures for pollution abatement by the form of pollution to be abated. Include the project cost or portion of the project cost incurred for the purpose of designing pollution abatement products or product characteristics or of designing pollution abatement features into processes. These expenditures should be included in item 3.A., line 3, columns (4) and (6).**
- **Estimate expenditures for pollution abatement research for 1996.**

		Key code	1994						1995						1996					
			Federal funds			Total funds			Federal funds			Total funds			Projected Federal funds			Projected total funds		
			(1)			(2)			(1)			(2)			(3)			(4)		
		11	Bil.	Mil.	Thou.	Bil.	Mil.	Thou.	Bil.	Mil.	Thou.	Bil.	Mil.	Thou.	Bil.	Mil.	Thou.	Bil.	Mil.	Thou.
A. Air	1. Automotive emissions	01																		
	2. Electric power plant emissions	02																		
	3. All other	03																		
	4. Total air	04																		
B. Water		05																		
C. Solid waste		06																		
D. Other		07																		
E. TOTAL – *Sum of lines A through D* →		08																		

Section III – RESEARCH AND DEVELOPMENT PERFORMED OUTSIDE THE DOMESTIC COMPANY WITH COMPANY FUNDS

Item 12 – FOREIGN RESEARCH AND DEVELOPMENT BY COUNTRY AND EXPENDITURE

Report the amount of total foreign research and development, item 3.C., column (5), for the countries with the largest expenditures. If necessary, write in countries not listed. Report the balance of foreign research and development on line 9.

	Key code	1996		
	12	Bil.	Mil.	Thou.
1. Canada	01			
2. Germany	02			
3. France	03			
4. Japan	04			
5. United Kingdom	05			
6. Other — *Specify*	06			
7. Other — *Specify*	07			
8. Other — *Specify*	08			
9. Balance not distributed	09			
10. TOTAL – *Sum of lines 1 through 9* →	10			

Item 13 – COVERAGE AND OPERATIONAL STATUS

A. Are research and development expenditures for entire domestic company, including subsidiaries, reported on this form?
1301 ☐ Yes
1302 ☐ No – *Please explain in the "Remarks" section on the back of the page*

B. Was this company owned or controlled by another company on December 31, 1995?
1303 ☐ Yes – *Complete 13.C.* 601 Date acquired Month ____ Year ____
1304 ☐ No

C. New owner information

602 Name

603 Address (*Number and street*)

604 City 605 State 606 ZIP Code

Item 14 – CERTIFICATION – This report is substantially accurate and has been prepared in accordance with instructions

Name of person to contact regarding this report Telephone Area code Number Extension

Signature of authorized official Title Date

SE REVERSE SIDE FOR REMARKS

FORM RD-1L(I)
(9-20-95)

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS

INSTRUCTIONS FOR SURVEY OF INDUSTRIAL RESEARCH AND DEVELOPMENT DURING 1995
FORM RD-1L

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DEFINITION OF RESEARCH AND DEVELOPMENT – R&D includes basic research and applied research in the sciences and in engineering, and design and development prototype products and processes.

For the purposes of this study, R&D includes activities carried on by persons trained, either formally or by experience, in the physical sciences including related engineering, and the biological sciences including medicine but excluding psychology, if the purpose of such activity is to do one or more of the following things:

1. Pursue a planned search for new knowledge, whether or not the search has reference to a specific application.
2. Apply existing knowledge to problems involved in the creation of a new product or process, including work required to evaluate possible uses.
3. Apply existing knowledge to problems involved in the improvement of a present product or process.

Research and development includes the activities described above whether assigned to separate R&D organizational units of the company or carried out by company laboratories and technical groups not part of an R&D organization. Reporting the R&D activities of such latter groups may require the use of estimates for some of the questions.

Activities to be excluded from R&D:

- Routine product testing
- Research in social sciences or psychology
- Geological and geophysical exploration activities
- Technical services such as:
- Quality and quantity control
- Technical plant sanitation control
- Trouble-shooting in connection with breakdowns in full-scale production
- Advertising programs to promote or demonstrate new products or processes
- Assistance in preparation of speeches and publications for persons not engaged in research and development.
- Social Science R&D – Social Science R&D is defined to encompass those activities devoted to further understanding the behavior of groups of human beings or of individuals as members of groups. Some of the topics include the following:
  - Personnel R&D
  - Economic R&D
  - Artificial intelligence and expert systems R&D
  - Consumer, market, and opinion R&D
  - Engineering psychology R&D
  - Management and organization R&D
  - Actuarial and demographic R&D
  - Educational processes and applications R&D
  - R&D in law

SPECIFIC INSTRUCTIONS

Section 1 – GENERAL COMPANY DATA

Item 1 – SALES AND EMPLOYMENT FOR THE COMPANY

Item 1A – Domestic Net Sales and Receipts

Sales and receipts are defined as the revenue for goods produced, distributed, or services provided. Include revenue from investments, rents, and royalties only if it is the principal business of the company. The reported figures should represent net value f.o.b. plant after discount and allowances and should exclude freight charges and excise taxes.

Include:

- All operating receipts from taxable operations, as well as total revenue from tax-exempt activities
- Sales of products and services to other companies, individuals, U.S. Government agencies, and foreign countries
- Transfers to foreign subsidiaries

Exclude:

- Domestic intra-company transfers
- Sales by foreign subsidiaries

Item 1B – Domestic Employment

Report the number of employees of the company in all activities in the 50 States and the District of Columbia during the pay period which includes March 12, 1995. This figure would be the same as Item 1 of Treasury Form 941, if one Form 941 was filed for the entire company. Report number of employees, not payroll.

Item 2 – NUMBER OF RESEARCH AND DEVELOPMENT SCIENTISTS AND ENGINEERS

Scientists and engineers are defined for this survey as all persons engaged in scientific or engineering work at a level which requires a knowledge of physical or life sciences or engineering or mathematics equivalent to completion of a 4-year college course with a major in these fields, regardless of whether or not they actually hold a degree in this field.

The figure on R&D scientists and engineers will be obtained primarily from two sources:

1. For company laboratories performing only research and development, report the number of scientists and engineers on the rolls in January.
2. For employees whose activities are not solely devoted to R&D, report the proportion of their time that is devoted to R&D. For example, if a company had the full-time equivalent of 60 scientists and engineers in January 1996 and one-fourth of their time was charged to R&D projects, the figure for the number of R&D scientists and engineers for this company would be 15.

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Item 3 – REPORT COSTS INCURRED FOR RESEARCH AND DEVELOPMENT

Include as costs:

- Wages, salaries, and related costs
- Materials and supplies consumed
- R&D depreciation
- Cost of computer software used in R&D activities
- Utilities, such as telephone, telex, electricity, water, and gas
- Travel costs and professional dues
- Property taxes and other taxes (except income taxes) incurred on account of the R&D organization or the facilities they use
- Insurance expenses
- Maintenance and repair, including maintenance of buildings and grounds
- Company overhead including: personnel, accounting, procurement and inventory, and salaries of research executives not on the payroll of the R&D organization

Exclude as costs:

- R&D performed abroad (outside the Continential U.S.) such as in Canada and Puerto Rico (Except in Item 3.C.)
- R&D performed by non-company R&D organizations of any kind (Except in Item 3.B.)
- Capital expenditures
- Patent expense
- Income taxes and interest
- The portion of company-held R&D contracts that were subcontracted outside the reporting company
- Fellowships, grants, and gifts to promote R&D or the study of science and engineering
- Social Science R&D

Item 3.A – Report Costs Incurred for Research and Development Performed Within the Company

Federally sponsored R&D performed within the company should be reported in column 4.

Costs of company sponsored R&D performed within the company, or R&D performed within the company under contract from non-federal sources should be reported in column 5.

Costs of INDEPENDENT R&D should also be reported in column 5. For the purpose of this survey, INDEPENDENT R&D is defined as R&D performed by the company for which you anticipate reimbursement by the government through indirect charges for the purchase of products or services.

Types of Research – Refer to page 5 for more information.

Item 3.A.1 – Basic Research

Include the cost of research projects which represent original investigation for the advancement of scientific knowledge and which do not have specific immediate commercial objectives, (although they may be in the fields of present or potential interest to the reporting company).

Item 3.A.2.a – Applied Research

Include the cost of research projects which represent investigation in discovery of new scientific knowledge and which have specific commercial objectives with respect to either products or processes.

Item 3.A.2.b – Development

Include the cost of projects which represent technical activity concerned with non-routine problems encountered in translating research. Include the findings or other general scientific knowledge into products or process.

Include as development:

- The design and operation of pilot plants and semiwork plants
- Engineering activity required to advance the design of a product or process so it meets specific functional and economic requirements
- Design, construction, and testing of prototypes and models
- Designs for special manufacturing equipment and tools
- Preparation of reports, drawings, formulas, specifications, standard practice instructions, or operating manuals

Exclude as development:

- Routine technical services to customers
- Toolmaking and tool tryout
- Production of detailed construction drawings and manufacturing blueprints
- Pre-production planning
- Any other items excluded from the definition of total R&D

ESTIMATING BASIC, APPLIED, AND DEVELOPMENT EXPENDITURES

If your company does not keep records that meet or can be allocated to these specific categories, estimate by:

- Isolating the projects that clearly fall in the development category. If your company fabricates products, such development activity will include the design, construction, and testing of prototypes and models. Some defense contracts typically call for several test models. If your company's research and development frequently involves the development of a "process" as in chemicals and petroleum, such development activity would include operations beyond the bench scale, primarily the design and operations of pilot plants or semiworks.
- Isolating the organizational units which have R&D activities that can be readily classified based on the function assigned to the unit. If R&D work is done in production units as well as in various laboratories, it is generally development type.
- Distributing the balance on the basis of individual projects or on the basis of other summaries of the work. Please use the definitions for basic, applied, and development given above.

Item 3.A.2.c – Total Costs for Applied Research and Development

Add line 3.A.2.a and line 3.A.2.b.

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Item 3.A.3. – Total Costs for Basic and Applied Research and Development Performed Within the Company

Add line 3.A1 and line 3.A.2.c.

Item 3.B – Total Costs Incurred for R&D Performed Outside the Company Within the United States and Financed by the Company

Report payments in the form of contracts, grants, and fellowships made to other industrial firms, commercial laboratories, consultants, educational institutions, hospitals, and research institutions or other organizations for R&D activities performed for the company.

Do not include subcontracting of R&D contracts received from the Federal Government or other companies.

Item 3.C – Total Costs Incurred for Research and Development Performed by Foreign Subsidiaries or by Other Organizations Outside of the United States and Financed by the Company

FOREIGN SUBSIDIARIES are those outside of the 50 States and the District of Columbia.

Report the amount of R&D financed by the U.S. parent or its foreign subsidiaries, including Canada and Puerto Rico, and performed by company R&D laboratories, branch plants, or other organizations, located outside the United States.

Exclude R&D activities performed by foreign subsidiaries which were financed by foreign governments or other outside organizations

Item 3.D –Total-Company and Other Funds, Except Federal

With the exception of "Other funds," this number represents company sponsored R&D performed within the company. It is comparable to information reported on Form 10K if you report to the Securities and Exchange Commission.

To complete this item, add line 3.A.3, line 3.B and line 3.C.

SOURCE OF FUNDS

Item 3 – FEDERAL FUNDS – (Columns 1+4)

Include:

- Amount of work done on Federal R&D contracts or subcontracts in the current year
- R&D portions of procurement contracts or subcontracts

Exclude:

- Federal R&D contracts and R&D portions of procurement contracts that you subcontracted to other R&D organizations (including these would cause duplication in the statistical totals, which include data on work actually performed by each company).
- If your company performs independent research and development (IR&D), please read the following carefully:
- Definition of IR&D – We define IR&D funds as expenditures that are reimbursable by the government for qualified projects that usually have potential interest to the Department of Defense or other agencies of the Federal government. These IR&D funds are not included in work done under a research contract with the government. They are reimbursed to the company through indirect charges to the government for the purchase of products or services.

HOW TO REPORT

Report expenditures for which you anticipate reimbursement as company funds in column 5. Report expenditures in the period for which they are incurred. Do not include the actual reimbursement.

Item 3 – COMPANY AND OTHER FUNDS

(Columns 2+5) Report all company-sponsored research and development performed within the company. Report R&D performed under contract from non-federal sources.

Item 4 – COMPANY AND OTHER FUNDS, EXCEPT FEDERAL, FOR RESEARCH AND DEVELOPMENT PERFORMED WITHIN THE COMPANY BUDGETED FOR THE YEAR 1996

Report the estimated cost of company and other non-federally sponsored R&D that will be performed within the 50 States and the District of Columbia. This item is comparable to the 1995 figure reported in item 3.A.3, column 5.

Section II – RESEARCH AND DEVELOPMENT PERFORMED WITHIN THE DOMESTIC COMPANY

Item 5 – COSTS INCURRED FOR FEDERAL RESEARCH AND DEVELOPMENT BY PRINCIPAL AGENCY

Distribute the cost of Federal research and development work (item 3A, line 3, columns 1 and 4) by Federal agency – If exact figures are not available by agency, please estimate or apportion according to the number of scientists and engineers working on the Federal projects and/or the costs of Federal programs.

Item 6 – COSTS INCURRED FOR RESEARCH AND DEVELOPMENT PERFORMED WITHIN THE COMPANY BY MAJOR TYPE OF EXPENSE

If most R&D is performed in units where summaries are regularly prepared by element of cost, base the breakdown of research and development costs upon the records of such units. If existing records do not yield figures for this item, the item may be estimated.

Item 6.1 – Wages and Salaries

Report the gross earnings paid in calendar year 1995 to employees engaged in R&D (follow the definition of salaries and wages that is used for calculating the withholding tax). Include salaries of officers in the research establishment(s) if a corporation; exclude payments to proprietor or partners if an unincorporated concern. (Scientists and engineers are defined in item 2.) Exclude employee fringe benefits which are to be reported in item 6.3 – Other Costs.

Item 6.2 – Materials and Supplies

Report the delivered cost for all purchased materials consumed, whether received from other companies, withdrawn from inventory, or received from other establishments of this company. Include all work that was done for your laboratories and other technical units by non company organizations (for example, model construction by a non company model shop). Exclude purchases from other R&D organizations.

Item 6.3 – Other Costs

Include items related to your R&D activities and not included in items 6.1 and 6.2. Include utilities, books and periodicals, property and other taxes, employee fringe benefits, and company overhead.

Item 7 – FIELDS OF BASIC RESEARCH

Use the following definitions to help you divide your company's basic research into broad research fields.

Item 7.1– Chemistry

Includes inorganic, organo-metallic, organic, and physical.

Item 7.2 – Engineering (Including metallurgy)

Includes aeronautical (including aerospace and space technology), chemical, nuclear, civil, electrical, and mechanical engineering, etc.) and metallurgy and materials.

Item 7.3 – Geological Sciences

Includes geodesy, hydrology, geochemistry, seismology, soil sciences, etc.

Item 7.4 – Mathematics

Includes areas such as algebra; foundations and logic; geometry; numerical analysis, etc.

Item 7.5 – Computer Sciences

Includes activities directed toward enhancing the understanding of computer structures and computational processes to provide bases for the future capabilities for computational solutions of presently intractable problems.

Item 7.6 – Physics

Includes acoustics; atomic and molecular; condensed matter; elementary particle; nuclear structure; optics; plasma.

Item 7.7 – Astronomy

Includes laboratory astrophysics; optical astronomy; radio astronomy; theoretical astrophysics; Gamma-ray, neutrino astronomy.

Item 7.8 – Atmospheric Sciences

Includes aeronomy; solar; weather modification; extraterrestrial atmospheres; meteorology.

Item 7.9 – Oceanography

Includes biological oceanography; chemical oceanography; physical oceanography; marine geophysics.

Item 7.10 – Biological Sciences

Includes all sciences (other than clinical medical sciences) which deal with life processes, including plant and animal sciences, biochemistry, cell biology, nutrition, microbiology, physiology, etc.

Item 7.11 – Clinical Medical Sciences

Includes all sciences concerned with the use of scientific knowledge for the identification, treatment, and cure of disease including internal medicine, neurology, preventive medicine and public health, pathology, pharmacology, psychiatry, dentistry, veterinary medicine, etc.

Item 7.12 – Other Sciences

To be used for multidisciplinary and interdisciplinary projects which cannot be classified within one of the above primary fields of science.

Item 7.13 – Total Basic Research Costs

This should be the same as Item 3.A.1., columns 3 and 6.

Item 8 – APPLIED RESEARCH AND DEVELOPMENT BY PRODUCT CLASS PERFORMED WITHIN THE COMPANY

Enter both Federal and total cost of applied R&D by product group. Costs should be entered in the field which is the END PRODUCT for the firm performing the R&D. For example, R&D in very large scale integrated (VLSI) circuits would be reported by a semiconductor firm on line 25, electrical industrial apparatus, if the chips are the final product sold by the firm. The same type of microelectronic R&D by a computer firm, however, would be reported on line 22, office, computing and accounting machines, if the chips are intended to be part of a computer which is the firm's end product.

Definitions for various fields of applied R&D are listed in the instructions for items 8.1 through 8.37. For those companies familiar with the Standard Industrial Classification (SIC), the 1987 SIC codes are given after each title. Note that the SIC definition here applies to each field of R&D and effort, and not necessarily to the overall code in which your company's manufacturing output is classified.

Report cost of Federally funded applied R&D by product group in column 1, and total cost of applied R&D by product group (also including Federal) in column 2.

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How To Report Atomic Energy Devices:

- Radioactive isotopes and other radiation sources should be reported in line 8.5.
- Partially fabricated reactor fuel element materials and control rods should be reported in line 8.14.
- Nuclear reactors; reactor components and equipment; core structurals; heat exchangers and condensers; valves; complete reactor fuel elements and control rods for use in propulsion, power plants, and other; and atomic waste casks should be reported in line 8.17.
- Fuel handling equipment, control rod drive mechanism and components for power plants, propulsion, and other; pressurizers, components, and auxiliary equipment; and pumps should be reported in line 8.23.
- Atom smashers (particle accelerators) should be reported in line 8.29.
- Accessory instrumentation for reactor control should be reported in line 8.34.
- Hot laboratory equipment and special instrumentation should be reported in line 8.35.

Item 8.1 – Food and Kindred Products (SIC 20)

Foods and beverages for human consumption and certain related products such as vegetable and animal fats and oils, and prepared feeds for animals and fowls.

Item 8.2 – Textile and Mill Products (SIC 22)

Mill preparation of fibers and mill manufacture of yarn, thread, twine etc; manufacture of broadwoven and knit.

Item 8.3 – Lumber and Wood Products (SIC 24)

Includes cutting timber and pulpwood: merchant sawmills, lath mills, shingle mills, cooperage stock mills, planing mills, and plywood mills and veneer mills engaged in producing lumber and wood basic materials; and establishments engaged in manufacturing finished articles made entirely or mainly of wood or related materials.

Item 8.4 – Paper and Allied Products (SIC 26)

Incudes manufacturing of pulps from wood and other cellulose fibers, and from rags; the manufacture of paper and paperboard; and the manufacture of paper and paperboard into converted products, such as paper coated off the paper machine, paper bags, paper boxes, and envelopes. Also included are establishments primarily engaged in manufacturing bags of plastic film and sheet.

Item 8.5 – Industrial Inorganic and Organic Chemicals (SIC 281 and 286)

Includes alkalies and chlorine, industrial gases, inorganic pigments, and industrial inorganic chemicals not elsewhere classified (n.e.c.). Also includes industrial organic chemicals including gum and wood chemicals, cyclic crudes, and cyclic intermediates, dyes, and organic pigments, and other industrial organic chemicals n.e.c. Includes radioactive isotopes and other radiation sources.

Item 8.6 – Plastics Materials and Synthetic Resins, Synthetic Rubber, Synthetic and Other Manmade Fibers (SIC 282)

Incudes cellulosic and noncellulosic fibers. Excludes glass which should be included in product group 13.

Item 8.7 Drugs (SIC 283)

Medicinal chemicals, biological and botanical products, and pharmaceutical preparations.

Item 8.8 – Agricultural Chemicals (SIC 287)

Fertilizers, agricultural pesticides, and other agricultural chemicals.

Item 8.9 – All Other Chemicals (Balance of SIC 28)

Includes explosives, soaps, glycerins, detergents and cleaning preparations, paints and varnishes, toilet preparation, and miscellaneous chemical products.

Item 8.10 – Petroleum Refining and Related Industries, Oil and Gas Extraction (SIC 13 and 29)

Excludes geological and geophysical exploration activities.

Item 8.11 – Rubber and Miscellaneous Plastics Products (SIC 30)

Fabricated rubber such as industrial and mechanical rubber goods and fabricated plastics products.

Item 8.12 – Leather and Leather Products (SIC 31)

Includes tanning, currying, and finishing hides and skins, leather converters, and establishments manufacturing finished leather and artificial leather products and some similar products made of other materials.

Item 8.13 – Stone, Clay, Glass, and Concrete Products (SIC 32)

Ceramics, glass, clay products, abrasives and asbestos products, cement, stone products, concrete products, and other nonmetallic mineral products.

Item 8.14 – Primary Ferrous Products (SIC 331, 332, 3399, and 3462)

Products of blast furnaces, steel works, rolling and finishing mills, iron and steel castings and forgings. Includes partially fabricated reactor fuel element materials and control rods.

Item 8.15 – Primary and Secondary Nonferrous Metals (Balance of SIC 33 and 346)

Primary and secondary smelting and refining of nonferrous metals, rolled, drawn, and extruded nonferrous metals products, castings and forgings.

Item 8.16 – Ordnance, Except Missiles (SIC 348, 3795)

Artillery, small arms, ammunition, tanks and parts, etc.

340

Item 8.17 – Fabricated Metal Products (SIC 34 Except 3462, 3463, and 348, Ferrous and Nonferrous Forgings, Ordnance)

Tinware, hand tools, nonelectric heating apparatus, fabricated structural metal products, metal stampings, fabricated wire products, etc., core structural (barrels, cans, boxes, plates, etc.); heat exchangers, steam and barometric condensers, and valves; and nuclear reactors, reactor components and equipment.

Item 8.18 – Engines and Turbines (SIC 351)

Steam engines, steam gas and hydraulic turbines, diesel and other internal combustion engines, n.e.c.

Item 8.19 – Farm and Garden Machinery and Equipment (SIC 352)

Farm machinery, including tractors for farm use.

Item 8.20 – Construction, Mining, and Materials Handling Machinery and Equipment (SIC 353)

Construction mining and oil field machinery and equipment, elevators, conveyors, hoists, industrial trucks, tractors, trailers, and stackers.

Item 8.21 – Metal working Machinery and Equipment (SIC 354)

Machine tools, dies, machine tool accessories, rolling mill machinery, power-driven hand-tools, and wire fabricating machinery and equipment.

Item 8.22 – Office, Computing, and Accounting Machines (SIC 357)

Electronic computing equipment; calculating and accounting machines; typewriters; other computing and office machines (except laboratory scales and balances).

Item 8.23 – Other Machinery, Except Electrical (Balance of SIC 35)

Special industrial machinery, except metalworking, such as food products machinery, textile and paper industries machinery, general industrial machinery and equipment, and miscellaneous machinery except electrical. Includes pumps, air and gas compressors, and industrial process furnaces and ovens. Includes atomic fuel holding equipment; control rod drive mechanism and components for use on nuclear reactors.

Item 8.24 – Electric Transmission and Distribution Equipment (SIC 361 and 3825)

Electric measuring instruments and test equipment power, distribution and specialty transformers, switchgear and switchboard transformers, etc.

Item 8.25 – Electrical Industrial Apparatus (SIC 362)

Electric motors and generators, motor starters and controls, carbon and graphite brushes, electrodes. Nonelectronic capacitors, condensers, and rectifiers.

Item 8.26 – Radio and Television Receiving Equipment, Except Communication Types (SIC 365)

Radio and television sets, home recorders, prerecorded magnetic tapes, microphones, speaker systems, turntables, phonograph records, compact disc players, etc.

Item 8.27 – Communications Equipment (SIC 366)

Telephone and telegraph apparatus, radio and television transmitting, signaling, and detection equipment and apparatus.

Item 8.28 – Electronic Components and Accessories (SIC 367)

Semiconductors, computer logic modules, computer chips. solid state electronic devices, integrated circuits, electronic capacitors, transformers, connectors, cathode ray tubes, solar cells, solid state photovoltaic devices, etc.

Item 8.29 – Other Electrical Machinery Equipment and Supplies (Balance of SIC 36)

Household appliances, electric lighting and wiring equipment, atom smashers, and miscellaneous electrical machinery, equipment and supplies.

Item 8.30 – Motor Vehicles and Equipment (SIC 371)

Motor vehicles such as ambulances, fire engines, personnel carriers, amphibian motor vehicles, truck and automobile trailers, and motor vehicle parts and accessories.

Item 8.31 – Aircraft and Parts (SIC 372)

Piloted and unpiloted aircraft and parts of all types, including engines and auxiliary equipment such as landing gear, de-icing equipment, and other auxiliary equipment specifically adopted for aircraft. Exclude radar and radio equipment, electronic sighting devices and aeronautical instruments which should be reported in product group 32.

Item 8.32 – Missiles and Space Vehicles (SIC 376)

Include frames or structures launching and handling support equipment and work on the missile system and space as a whole. Exclude electronic guidance control subassemblies and radar which should be reported in product group 35.

Item 8.33 – Other Transportation Equipment (Balance of SIC 37 Except 3795)

Ship building, boat building and repairing, railroad equipment, motorcycles, bicycles, and parts, etc. Exclude tanks and tank components which are in product group 16.

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Item 8.34 – Scientific and Mechanical Measuring Instruments (SIC 381, 382 Part)

Engineering, laboratory, scientific, and research instruments, and associated equipment; automatic controls for regulating residential and commercial environments and appliances; industrial instruments for measurement, display, and control of process variables; nonelectric fire detecting systems, totalizing fluid meters and counting devices; instruments for measuring and testing electricity and electrical signals, and radar systems and equipment; accessory instrumentation for reactor control.

Item 8.35 – Optical, Surgical, Photographic, Timing and Other Instruments (Balance of SIC 38, SIC 382 Part)

Optical instruments and lenses; surgical and medical instruments and apparatus; dental equipment and supplies; ophthalmic goods including contact lenses; optical fire control equipment; photographic equipment and supplies including film and motion picture apparatus; watches, clocks, clockwork operated devices and parts, appliance timers, chronometers.

Item 8.36 – Computer Programming, Data Processing, and Other Computer Related Services (SIC 737)

Includes computer programming services, prepackaged software, computer integrated systems design, computer processing and data preparation and processing services, information retrieval services, computer facilities management services, computer rental and leasing, computer maintenance and repair.

Item 8.37 – Other

Please write-in the category.

Item 9 – COST OF RESEARCH AND DEVELOPMENT PERFORMED WITHIN THE COMPANY, BY STATE

Report the cost of R&D for each State in which your company has research and development laboratories or facilities. It is not necessary to calculate separately individual assignments which may be made outside the home State of a particular research staff.

As much as 10 percent of the total may, if desired, be reported in line 52 as "Not distributed by State."

Item 10 – ENERGY RESEARCH AND DEVELOPMENT

Include all spending for R&D to increase energy resources or capabilities, including the development of energy equipment. Energy research and development can include costs of R&D projects (both product and process) on exploration, extraction, transportation, processing, storage, generation (including conversion), distribution, conservation, etc., of present, new, or improved forms of energy. Record energy R&D spending according to type of energy in Items 10A through 10E.

If R&D spending is for joint or multiple purposes, estimate and report the portion of cost incurred for the energy purpose. In the limited number of cases where the separation of joint (multiple) costs by type of energy cannot be estimate, include the total cost of the R&D project when the primary purpose of the project is energy research and development. If the project is not primarily for energy research and development then exclude all of the project cost.

Item 10B4 – "Coal"

"Synthetic fuels" includes programs designed to convert coal to gaseous and liquid products. "Mining" is composed of programs for developing equipment and techniques to improve the productivity and recovery rates of coal mining.

Item 10C3 – "Conservation and Utilization"

Includes R&D activities undertaken to reduce consumption either at the point of energy use or in the transmission, transportation, storage, and conversion of energy. Examples of such are R&D undertaken primarily to reduce fuel consumption in manufacturing, to improve the efficiency of transportation of energy products, or to produce an end product which is more efficient in energy consumption.

Item 10D – "All Other Energy"

Includes areas such as wind, waste, hydroelectric, etc. Also include in this category the development of energy equipment which cannot be readily classified in Items 10A through 10C.

Item 11 – POLLUTION ABATEMENT RESEARCH AND DEVELOPMENT PERFORMED WITHIN THE COMPANY

Includes R&D spending for the purpose of reducing or eliminating the emission of pollutants. "Pollution" refers to the emission of pollutants to the outside of a firm's property or activities; "abatement" includes prevention, treatment, or recycling.

Exclude costs:

- to contribute to environmental aesthetics
- to increase equipment durability in corrosive environments
- to conserve energy (include as energy R&D in item 5.3.)
- to conserve natural resources
- to increase employee comfort, safety, and health

If the only purpose of the R&D spending is pollution abatement, include the total expenditures on the project. If pollution abatement is only one of several purposes, report only the R&D costs associated with pollution abatement. When the separation of joint costs is not feasible, include the total R&D costs for a project if the purpose is primarily (more than 50 percent) for pollution abatement.

If the project is not primarily for pollution abatement purposes, exclude all of the project costs. Also exclude project costs if expected pollution abatement benefits are obtained at no extra cost.

Item11A – Air

1. Automotive emissions includes all R&D efforts undertaken to reduce exhaust emissions from automobiles.
2. Electric power plants emissions includes efforts directed toward reducing airborne emissions from electric power plants.
3. "All other" includes efforts directed at removing sulfur oxide, nitrogen oxides and particulates, and other fossil-fuel pollutants from the atmosphere.

Item 11B – Water

Includes R&D spending on water recirculation or thermal pollution abatement, etc.

Item 11C – Solid Waste

Includes R&D spending on waste compacting devices, etc.

Item 11D – Other

Includes R&D spending on pollution abatement from noise and radiation, etc.

Section III – RESEARCH AND DEVELOPMENT PERFORMED OUTSIDE THE DOMESTIC COMPANY WITH COMPANY FUNDS

This section of the report form covers the R&D reported in item 3.C of section I, on page one.

Item 12 – FOREIGN RESEARCH AND DEVELOPMENT BY COUNTRY AND EXPENDITURE

Allocate the totals reported in Item 3.C., column 5 by the country in which your various research and development takes place. Estimate the costs associated with each country. If necessary, you may write in countries not listed.

Item 13 – COVERAGE AND OPERATIONAL STATUS

Item 13A

Check the appropriate box if the domestic company expenditures on this form, including all subsidiaries, have R&D. If no, please explain in remarks section or in a transmittal letter.

Item 13B

Check the appropriate box if this company was owned or controlled by another company on December 31, 1995. If yes, provide date of the organizational change.

Item 13C

Provide the name and address of the new owner. In the "Remarks" section, specify change or correction, e.g., wholly-owned subsidiary of ABC Company", "merger with XYZ Company", "acquired by 123 Corporation".

Item 14 – CERTIFICATION

Report the name and telephone number of the person to contact regarding this report.

☆U.S. GOVERNMENT PRINTING OFFICE: 1995 - 750-112/20127

DUE DATE: 60 DAYS AFTER RECEIPT OF FORM

OMB No. 3145-0027: Approval Expires 1/31/99

FORM **RD-1A**
(2-09-96)

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS

SURVEY OF INDUSTRIAL RESEARCH AND DEVELOPMENT DURING 1995

In correspondence pertaining to this report refer to this **CENSUS FILE NUMBER (11 digits)** ▶

NOTICE — Your report to the Census Bureau is **confidential** by law (title 13, U.S. Code).

The instructions and definitions on this form are not complete. Please read the enclosed instruction sheet before completing this form.

RETURN TO

▼

BUREAU OF THE CENSUS
1201 East 10th Street
Jeffersonville, IN 47132-0001

Data supplied in items 2A and B and in item 3A.3, columns 1 and 3 for 1995 on this form will satisfy the mandatory reporting requirements (title 13, U.S. Code).

FROM THE DIRECTOR
BUREAU OF THE CENSUS

We have enclosed your company's report form and instructions for the 1995 "Survey of Industrial Research and Development." **Please review the instructions, complete the form, and return it within 60 days.** If you conduct research and development, Federal law requires your responses to four items identified on the form. Your voluntary responses to all other items are needed to assure useful results. This survey can help your business and trade association plan new products and markets, and assist public officials in research funding and tax decisions that affect your industry.

Information you report should cover all your company's domestic operations for calendar year 1995. We recognize that providing this information is a burden and we have worked hard to minimize it. For example, if you do not have book records for any item, **you may provide carefully prepared estimates.** The law that authorizes this survey (Title 13, United States Code) requires that we keep your report in full confidence. Only sworn Census Bureau employees will see your information, and they will use it only for statistical purposes.

We conduct this survey with National Science Foundation (NSF) support. We have enclosed a letter from the Director of the NSF emphasizing the importance and usefulness of the survey. If you have any questions, please call my staff on 301-457-1339. Thank you in advance for your cooperation.

Sincerely,

Martha Farnsworth Riche

Martha Farnsworth Riche
Enclosures

PLEASE OPEN AND BEGIN THE SURVEY WITH ITEM 1.

RESEARCH AND DEVELOPMENT — R&D

Includes basic and applied research in the sciences and in engineering, and design and development of prototype products and processes.

For the purposes of this survey, research and development includes activities carried on by persons trained, either formally or by experience, in the physical sciences including related engineering, and the biological sciences including medicine but excluding psychology, if the purpose of such activity is to do one or more of the following things:

1. Pursue a planned search for new knowledge, whether or not the search has reference to a specific application. (Basic Research)
2. Apply existing knowledge to problems involved in the creation of a new product or process, including work required to evaluate possible uses. (Applied Research)
3. Apply existing knowledge to problems involved in the improvement of a present product or process. (Development)

Research and development includes the activities described above whether assigned to separate R&D organizational units of the company or carried out by company laboratories and technical groups not part of an R&D organization. Reporting the R&D activities of such latter groups may require the use of estimates for some of the questions.

Activities to be excluded from R&D are as follows: research in social sciences or psychology, routine product testing, geological and geophysical exploration activities and technical services.

See instructions for more detail.

Item 1 – CHECK FOR RESEARCH AND DEVELOPMENT

Mark (X) the appropriate box.

201 ☐ Company had R&D in 1995 – *Complete form, enter zeros where applicable, and return this form.*
202 ☐ Company had no R&D in 1995, but has in the past and may in the future – *Go to item 6, sign, and return this form.*
203 ☐ Company does not conduct R&D – *Go to item 6, sign, and return this form.*

NOTE – After reviewing item 1 if you need further assistance please call (301) 457–1339.

Item 2 – SALES AND EMPLOYMENT FOR COMPANY

	Domestic sales and receipts of this company 1995 Bil. / Mil. / Thou. / Dol.
A. INCLUDE sales of products and services to other companies, individuals, U.S. Government agencies, and foreign countries from all domestic operations of your company.	102 $ 000
	Domestic employment 1995 Number
B. Total domestic company employment in all activities during the pay period which includes the 12th of March 1995. (Item 1 of I.R.S. Form 941, if one Form 941 was filed for the entire company.)	112
C. NUMBER OF RESEARCH AND DEVELOPMENT SCIENTISTS AND ENGINEERS Includes all persons engaged in scientific or engineering work at a level which requires a knowledge of physical or life sciences, engineering, or mathematics equivalent to completion of a 4-year college course of study with a major in these fields, regardless of whether or not they actually hold a degree in this field.	**Scientists and engineers**
Report the full-time equivalent number of R&D scientists and engineers on the rolls in January 1996. For employees whose activities are not solely devoted to research and development, report the proportion of their time that is devoted to research and development. *(See instructions for examples)*	January 1996 Number 502

345

Item 3 - REPORT COSTS INCURRED FOR RESEARCH AND DEVELOPMENT IN 1995

	Federal funds (1)				Company and other (2)				Total ((1) + (2)) (3)			
	Bil.	Mil.	Thou.	Dols.	Bil.	Mil.	Thou.	Dols.	Bil.	Mil.	Thou.	Dols.
A. WITHIN THE COMPANY – Costs incurred for research and development performed within the company by major type and source of funds *(Should be excluded from B and C)*												
1. Basic research *If "None," please mark (X)* → 300 ☐	304 $			000	305 $			000	306 $			000
2. Applied research and development – **a.** Applied research	314 $			000	315 $			000	316 $			000
b. Development	324 $			000	325 $			000	326 $			000
c. Total *(Sum of lines a and b)* →	334 $			000	335 $			000	336 $			000
3. TOTAL *(Sum of 1 and 2c)* →	344 $			000	345 $			000	346 $			000
B. Outside the company – Total company funds for research and development activities financed by the company but performed by others outside the company within the United States *(Should be excluded from A3)*					355 $			000				
C. Foreign – Total company funds for research and development activities performed by foreign subsidiaries or by other organizations outside the United States *(Should be excluded from A3)*					365 $			000				
D. TOTAL – Company and other funds, except Federal *(This line represents company sponsored research and development with the exception of "other funds.") (Sum of A3 (column 2), B, and C)* →					375 $			000				

Item 4 - COMPANY AND OTHER FUNDS, EXCEPT FEDERAL FOR RESEARCH AND DEVELOPMENT PERFORMED WITHIN THE COMPANY BUDGETED FOR THE YEAR 1996

Bil.	Mil.	Thou.	Dols.
401 $			000

346

Item 5A – COVERAGE AND OPERATIONAL STATUS

Are research and development expenditures for entire domestic company, including subsidiaries reported on this form?

☐ Yes
☐ No – *Please explain in remarks or on transmittal letter.*

Was this company owned or controlled by another company on December 31, 1995?

☐ Yes – *Complete 5B.* Date acquired ⟶
☐ No

601

Month	Year

Item 5B – NEW OWNER OR OPERATOR

602 Name

603 Address

604 City	605 State	606 ZIP Code

CHECK ITEM Please complete the checks listed below BEFORE returning this questionnaire. By checking these items you will reduce the likelihood of our calling you to resolve an error or inconsistency.

	Yes	No
In item 2A:		
1. Sales is reported in **thousands** of dollars	☐	☐
In item 2B:		
2. Your answer describes the number of **employees**, NOT company payroll	☐	☐
In item 3:		
3. Verify that **Federal funds** (column 1) plus **Company funds** (column 2) equals **Total funds** (column 3) for:		
a. Basic research (3A.1)	☐	☐
b. Applied research (3A.2a)	☐	☐
c. Development (3A.2b)	☐	☐
d. Total applied research and development (3A.2c)	☐	☐
e. Total costs within the company (3A.3)	☐	☐
4. Verify that **basic** research (3A.1) plus **applied** research and development (3A.2c) equals total funds spent within the company (3A.3)	☐	☐
5. Verify in **column 2** (Company and other), that total funds **within** the company (3A.3), plus funds spent outside the company (3B) and by **foreign** subsidiaries (3C), equals total funds spent (3D)	☐	☐

IF THE ANSWER TO ANY OF THE ABOVE CHECKS IS "NO", PLEASE MAKE THE NECESSARY CORRECTIONS IN THE APPROPRIATE ITEM(S) OR PROVIDE AN EXPLANATION IN THE REMARKS SECTION.

Item 6 – CERTIFICATION – This report is substantially accurate and has been prepared in accordance with instructions.

Name of person to contact regarding this report

Telephone ⟶	Area code	Number	Extension

Signature of authorized official

Title	701 Date

801 REMARKS

FORM **RD-1A(I)**
(9-20-95)

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS

INSTRUCTIONS AND DEFINITIONS FOR SURVEY OF INDUSTRIAL RESEARCH AND DEVELOPMENT DURING 1995
FORM RD-1A

GENERAL INSTRUCTIONS

Please complete and return this form in the envelope provided within 60 days. Make a copy for your records.

INTRODUCTION – Comprehensive and timely information about the nature and support of corporate research and development (R&D) activities is an important component in the overall assessment of our nation's scientific and technological resources. The information you provide is used to prepare national measures of industrial R&D not available from any other source. By carefully completing this report, the accuracy of this information is ensured.

SURVEY SCOPE – This report covers both public and privately-owned nonfarm business firms in all sectors of the United States economy. It does not include operations owned by Federal, State or local governments, or nonprofit organizations.

If your company is a nonprofit organization, please indicate so in the remarks section, page 3, and return the form.

If this form has been directed to a trust or pension plan which performs no activity other than investments, do not report. Please note in remarks section, page 3, and return the form.

REPORTING ENTITY – Report R&D for all domestic operations of your company, including subsidiaries and divisions. Report for all parts of the company that are located in the 50 States and the District of Columbia. Report sales and employment figures for all parts of the company, even those that do not perform R&D, as long as they are located in the 50 States or the District of Columbia.

If this form has been directed to a holding company, report for all subsidiaries and operations under the ownership and control of the holding company.

ESTIMATES ARE ACCEPTABLE – If you cannot answer a question from your company records, please estimate the answer carefully.

HOW TO REPORT – Report all value figures in thousands of dollars.

Example: 1,123,678,599 dollars.

	Bil.	Mil.	Thou.	Dol.
Report	$1	123	679	000

If you estimate your answers in millions of dollars, please fill the thousands box with zeros.

Example: 1,124 million dollars.

	Bil.	Mil.	Thou.	Dol.
Report	$1	124	000	000

Enter "0" where appropriate rather than leaving a blank space.

PERIOD COVERED BY THE REPORT – Figures should be reported on a calendar year basis. Fiscal year data are acceptable for all items except for employment, provided your fiscal year ends between September and March. Please report employment figures (Items 2B and 2C) for the specific time indicated for both of these items.

ADDITIONAL FORMS – Photocopies of this form are acceptable. If you require additional forms, write to the Bureau of the Census, 1201 East 10th Street, Jeffersonville, IN 47132-0001 or call (812) 288-3331.

FILING EXTENSIONS – If you cannot complete the survey in 60 days, request an extension of time by writing to the address below (please include your Census File Number):

Bureau of the Census
1201 East 10th Street
Jeffersonville, IN 47132-0001

or call: (812) 288–3331.

BURDEN HOUR ESTIMATE – Public reporting burden for this collection of information is estimated to average 1 hour per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimates or any other aspects of this collection of information including suggestions for reducing this burden to Herman G. Fleming, National Science Foundation, 4201 Wilson Boulevard, Arlington, VA 22230.

Direct any QUESTIONS regarding this form to the Bureau of the Census, Attn: Environment and Technology Branch, FB 4, Room 2135, Washington, DC 20233–0001, or call (301) 457–1339. Please review item 1 of the instructions and questionnaire before calling for assistance.

DEFINITION OF RESEARCH AND DEVELOPMENT – R&D includes basic research and applied research in the sciences and in engineering, and design and development of prototype products and processes.

For the purposes of this study, R&D includes activities carried on by persons trained, either formally or by experience, in the physical sciences including related engineering, and the biological sciences including medicine but excluding psychology, if the purpose of such activity is to do one or more of the following things:

1. Pursue a planned search for new knowledge, whether or not the search has reference to a specific application.

2. Apply existing knowledge to problems involved in the creation of a new product or process, including work required to evaluate possible uses.

3. Apply existing knowledge to problems involved in the improvement of a present product or process.

Research and development includes the activities described above whether assigned to separate R&D organizational units of the company or carried out by company laboratories and technical groups not part of an R&D organization. Reporting the R&D activities of such latter groups may require the use of estimates for some of the questions.

Activities to be excluded from R&D:

- Research in social sciences or psychology
- Routine product testing
- Geological and geophysical exploration activities
- Technical services such as:
    - Quality and quantity control
    - Technical plant sanitation control
    - Trouble-shooting in connection with breakdowns in full-scale production
    - Advertising programs to promote or demonstrate new products or processes
    - Assistance in preparation of speeches and publications for persons not engaged in research and development.
- Social Science R&D – Social Science R&D is defined to encompass those activities devoted to further understanding the behavior of groups of human beings or of individuals as members of groups. Some of the topics include the following:
    - Personnel R&D
    - Economic R&D
    - Artificial intelligence and expert systems R&D
    - Consumer, market, and opinion R&D
    - Engineering psychology R&D
    - Management and organization R&D
    - Actuarial and demographic R&D
    - Educational processes and applications R&D
    - R&D in law

SPECIFIC INSTRUCTIONS

Item 1 – CHECK FOR RESEARCH AND DEVELOPMENT

Check the box that best describes the R&D activities of your company. If your company conducted R&D in 1995 check box 201 and continue on with item 2.

If your company did not conduct R&D in 1995 check the appropriate box, 202 or 203. Do not complete the data items. Go to item 6, sign and return the form.

Item 2 – SALES AND EMPLOYMENT FOR THE COMPANY

Item 2A – Domestic Sales and Receipts

Sales and receipts are defined as the revenue for goods produced, distributed, or services provided. Include revenue from investments, rents, and royalties only if it is the principal business of the company. The reported figures should represent net value f.o.b. plant after discount and allowances and should exclude freight charges and excise taxes.

Include:

- All operating receipts from taxable operations, as well as total revenue from tax-exempt activities
- Sales of products and services to other companies, individuals, U.S. Government agencies, and foreign countries
- Transfers to foreign subsidiaries

Exclude:

- Domestic intra-company transfers
- Sales by foreign subsidiaries

Item 2B – Domestic Employment

Report the number of employees of the company in all activities in the 50 States and the District of Columbia during the pay period which includes March 12, 1995. This figure would be the same as Item 1 of Treasury Form 941, if one Form 941 was filed for the entire company. Report number of employees, not payroll.

Item 2C – NUMBER OF RESEARCH AND DEVELOPMENT SCIENTISTS AND ENGINEERS

Scientists and engineers are defined for this survey as all persons engaged in scientific or engineering work at a level which requires a knowledge of physical or life sciences or engineering or mathematics equivalent to completion of a 4-year college course with a major in these fields, regardless of whether or not they actually hold a degree in this field.

The figure on R&D scientists and engineers will be obtained primarily from two sources:

1. For company laboratories performing only R&D, report the number of scientists and engineers on the rolls in January.
2. For employees whose activities are not solely devoted to R&D, report the proportion of their time that is devoted to R&D. For example, if a company had the full-time equivalent of 60 scientists and engineers in January 1996 and one-fourth of their time was charged to R&D projects, the figure for the number of R&D scientists and engineers for this company would be 15.

Item 3 – REPORT COSTS INCURRED FOR RESEARCH AND DEVELOPMENT

Include as costs:

- Wages, salaries, and related costs
- Materials and supplies consumed
- R&D depreciation
- Cost of computer software used in R&D activities
- Total charges for work done on contract, including profit
- Utilities, such as telephone, telex, electricity, water, and gas
- Travel costs and professional dues
- Property taxes and other taxes (except income taxes) incurred on account of the R&D organization or the facilities they use

- Insurance expenses
- Maintenance and repair, including maintenance of buildings and grounds
- Company overhead including: personnel, accounting, procurement and inventory, and salaries of research executives not on the payroll of the R&D organization

Exclude as cost:

- R&D performed abroad (outside the Continental U.S.), such as in Canada and Puerto Rico (Except in Item 3.C.)
- R&D performed by non-company R&D organizations of any kind (Except in Item 3.B.)
- Capital expenditures
- Patent expense
- Income taxes and interest
- The portion of company-held R&D contracts that were subcontracted outside the reporting company
- Fellowships, grants, and gifts to promote R&D or the study of science and engineering
- Social Science R&D

Item 3.A – Report Costs Incurred for Research and Development Performed Within the Company

Federally sponsored R&D performed within the company should be reported in column 1.

Costs of company sponsored R&D performed within the company, or R&D performed within the company under contract from non-federal sources should be reported in column 2.

Costs of INDEPENDENT R&D should also be reported in column 2. For the purpose of this survey, INDEPENDENT R&D is defined as R&D performed by the company for which you anticipate reimbursement by the government through indirect charges for the purchase of products or services.

See page 4 for more information.

TYPES OF RESEARCH

Item 3.A.1 – Basic Resesarch

Include the cost of research projects which represent original investigation for the advancement of scientific knowledge and which do not have specific immediate commercial objectives (although they may be in the fields of present or potential interest to the reporting company).

Item 3.A.2.a – Applied Research

Include the cost of research projects which represent investigation in discovery of new scientific knowledge and which have specific commercial objectives with respect to either products or processes.

Item 3.A.2.b – Development

Include the cost of projects which represent technical activity concerned with non-routine problems encountered in translating research findings or other general scientific knowledge into products or process.

Include as development:

- The design and operation of pilot plants and semiwork plants
- Engineering activity required to advance the design of a product or process so it meets specific functional and economic requirements
- Design, construction, and testing of prototypes and models
- Designs for special manufacturing equipment and tools
- Preparation of reports, drawings, formulas, specifications, standard practice instructions, or operating manuals
- Software developement

Exclude as development:

- Routing technical services to customers
- Toolmaking and tool tryout
- Production of detailed construction drawings and manufacturing blueprints
- Pre-production planning

ESTIMATING BASIC, APPLIED, AND DEVELOPMENT EXPENDITURES

If your company does not keep records that meet or can be allocated to these specific categories, estimate by:

- Isolating the projects that clearly fall in the development category. If your company fabricates products, such development activity will include the design, construction, and testing of prototypes and models. Some defense contracts typically call for several test models. If your company's R&D frequently involves the development of a "process" as in chemicals and petroleum, such development activity would include operations beyond the bench scale, primarily the design and operations of pilot plants or semiworks.
- Isolating the organizational units which have R&D activities that can be readily classified based on the function assigned to the unit. If R&D work is done in production units as well as in various laboratories, it is generally development type.
- Distributing the balance on the basis of individual projects or on the basis of other summaries of the work. Please use the definitions for basic, applied, and development given above.

Item 3.A.2.c – Total Costs for Applied Research and Development

Add line 3.A.2.a and line 3.A.2.b.

Item 3.A.3 – Total Costs for Basic and Applied Research and Development Performed Within the Company

Add line 3.A.1 and line 3.A.2.c.

Item 3.B – Total Costs Incurred for Research and Development Performed Outside the Company Within the United States and Financed by the Company

Report payments in the form of contracts, grants, and fellowships made to other industrial firms, commercial laboratories, consultants, educational institutions, hospitals, and research institutions or other organizations for R&D activities performed for the company.

Do not include subcontracting of R&D contracts received from the Federal Government or other companies.

Item 3.C – Total Costs Incurred for Research and Development Performed by Foreign Subsidiaries or by Other Organizations Outside of the United States and Financed by the Company

FOREIGN SUBSIDIARIES are those outside of the 50 States and the District of Columbia.

Report the amount of R&D financed by the U.S. parent or its foreign subsidiaries, including Canada and Puerto Rico, and performed by company R&D laboratories, branch plants, or other organizations, located outside the United States. Report R&D activities of foreign divisions and subsidiaries in Item 3.C only.

Exclude R&D activities performed by foreign subsidiaries which were financed by foreign governments or other outside organizations

Item 3.D – Total – Company and Other Funds, Except Federal

With the exception of "Other funds," this number represents company sponsored R&D performed within the company. It is comparable to information reported on Form 10K if you report to the Securities and Exchange Commission.

To complete this item, add line 3.A.3, line 3.B and line 3.C.

SOURCE OF FUNDS

Item 3 – FEDERAL FUNDS (Column 1)

Include:

- Amount of work done on Federal R&D contracts or subcontracts in the current year
- R&D portions of procurement contracts or subcontracts

Exclude:

Federal R&D contracts and R&D portions of procurement contracts that you subcontracted to other R&D organizations (including these would cause duplication in the statistical totals, which include data on work actually performed by each company).

If your company performs independent research and development (IR&D), please read the following carefully:

Definition of IR&D – We define IR&D funds as expenditures that are reimbursable by the government for qualified projects that usually have potential interest to the Department of Defense or other agencies of the Federal government. These IR&D funds are not included in work done under a research contract with the government. They are reimbursed to the company through indirect charges to the government for the purchase of products or services.

HOW TO REPORT – Report expenditures for which you anticipate reimbursement as company funds in column 2. Report expenditures in the period for which they are incurred. Do not include the actual reimbursement.

Item 3 – COMPANY AND OTHER FUNDS (Column 2)

Report all company-sponsored R&D performed within the company. Report R&D performed under contract from non-Federal sources.

Item 4 – COMPANY AND OTHER FUNDS, EXCEPT FEDERAL, FOR RESEARCH AND DEVELOPMENT PERFORMED WITHIN THE COMPANY BUDGETED FOR THE YEAR 1994

Report the estimated cost of company and other non-federally sponsored R&D that will be performed within the 50 States and the District of Columbia. This item is comparable to the 1995 figure reported in item 3.A.3, column 2.

Item 5A – Coverage and Operational Status

Indicate if this form includes R&D expenditures for the entire domestic company, including subsidiaries. Indicate if this company was owned or controlled by another company on December 31, 1995.

Item 5B – New Owner or Operator

Report the date the company was acquired and the new owner's name and address information.

CHECK ITEM

Mark "Yes" or "No" as appropriate for each of the checks in this item. If the answer to any of the checks is "No", provide an explanation in the remarks section.

Item 6 – CERTIFICATION

Report the name and telephone number of the person to contact regarding this report.

☆ U.S. GPO: 1995-750-074/20252

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NATIONAL SCIENCE FOUNDATION
4201 WILSON BOULEVARD
ARLINGTON, VIRGINIA 22230

OFFICE OF THE
DIRECTOR

FROM THE DIRECTOR
NATIONAL SCIENCE FOUNDATION

The National Science Foundation requests your company's participation in the 1996 Survey of Industrial Research and Development that the Bureau of the Census is conducting for us. This annual survey is the only source of detailed information on U.S. industry's research and development (R&D) performance.

Your company's participation is vital to the accuracy of the resulting information. Because R&D expenditures are concentrated in relatively few companies, a completed response is needed from each surveyed firm — *there is no substitute for the information that you can provide.* Your company can be assured of complete confidentiality. Survey data will be released only in aggregate form so that responses of individual companies cannot be identified.

Survey results will be made available to government and industry officials, researchers, and other interested individuals. If you have questions concerning the operation of this survey, please direct them to the Census Bureau's Special Studies Branch on 301–457–1339. If you would like to receive a copy of the final publication, please call Jennifer Held in NSF's Division of Science Resources Studies on 703–306–1772.

Sincerely,

Neal Lane

Neal Lane
Director

Enclosures

RD-1-L1
(2-97)

UNITED STATES DEPARTMENT OF COMMERCE
Bureau of the Census
Washington, DC 20233-0001

OFFICE OF THE DIRECTOR

FROM THE DIRECTOR
BUREAU OF THE CENSUS

We have enclosed your company's report form and instructions for the 1996 "Survey of Industrial Research and Development. " We have also enclosed a Computerized Self-Administered Questionnaire (CSAQ) diskette as an alternative to the report form, along with instructions for installing it. If you have any questions about installing or using the diskette, please contact the Electronic Reporting Staff on 1–301–457–4125.

The diskette and Form RD-1(S) contain information from the previous report for your company. **Please review the instructions, complete the diskette or the form, and return it within 60-days.** Federal law requires your responses to four items identified on the form.Your voluntary responses to all other items are needed to assure useful results.

This survey provides information for examining R&D tax credits which may allow some businesses to reduce their Federal tax burden.The data assist public officials in allocating research funding by state which may well benefit companies like yours. Analysts also use the results to compare R&D spending in this country with others to ensure that U.S. businesses are not at a competitive disadvantage.

Information you report should cover the domestic operations of your consolidated enterprise for calendar year 1996. We recognize that providing this information is a burden and we have worked hard to minimize it. For example, if you do not have book records for any item, **you may provide carefully prepared estimates**. The law that authorizes this survey (Title 13, United States Code) requires that we keep your report in full confidence. Only sworn Census Bureau employees will see your information, and they will use it only for statistical purposes.

We conduct this survey with National Science Foundation (NSF) support. We have enclosed a letter from the Director of NSF encouraging your response to the survey. If you have any questions, please telephone my staff on 1–301–457–1339. Thank you in advance for your cooperation.

Sincerely,

Martha Farnsworth Riche

Martha Farnsworth Riche

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Enclosures

PLEASE RETURN BY: ☐

OMB No. 3145-0027: Approval Expires 01/31/99

NOTICE – Your report to the Census Bureau is confidential by law (Title 13, U.S. Code). It may be seen only by sworn Census employees and may be used only for statistical purposes. The law also provides that copies retained in your files are immune from legal process.

RETURN TO

Bureau of the Census
1201 East 10th Street
Jeffersonville, IN 47132-0001

Name of person who supplied 1995 data

Data supplied in items 1A and 1B and in item 3A, line 3, columns 4 and 6, for 1996 on this form will satisfy the mandatory reporting requirements. (Title 13, U.S. Code.)

CENSUS USE ONLY

SURVEY CODE
4001

INDUSTRY CODE

WEIGHT

STATE

ADDRESS

SIC CODE

FORM **RD-1(S)**

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
COLLECTING AND COMPILING AGENT FOR
THE NATIONAL SCIENCE FOUNDATION

SURVEY OF INDUSTRIAL RESEARCH AND DEVELOPMENT DURING 1996

In correspondence pertaining to this report refer to this **CENSUS FILE NUMBER (10 digits)**

(Please correct any error in name and address, including ZIP Code.)

THIS REPORT SHOULD COVER YOUR ENTIRE CONSOLIDATED DOMESTIC ENTERPRISE, INCLUDING ALL U.S. SUBSIDIARIES AND DIVISIONS.

The term "company" on this form refers to the consolidated domestic enterprise.

- Please complete this form by the date printed at the top of this page and return it in the envelope provided. Make a copy for your records.
- Please read the enclosed instructions before completing this form.
- Report figures in thousands of dollars. Reasonable estimates are acceptable.
- Explain significant changes in year-to-year data in the remarks section.

COVERAGE REVIEW

Was this company owned or controlled by another company on December 31, 1996?

1303 ☐ Yes – *See instructions for Coverage Review.*
1304 ☐ No – *Continue with item 1*

Item 1 – RECEIPTS AND EMPLOYMENT FOR THE COMPANY

	1995			1996		
	Bil.	Mil.	Thou.	Bil.	Mil.	Thou.
A. Net sales, operating receipts and revenues of domestic operations of this company (Report in thousands of dollars) INCLUDE receipts for sales of products and services provided to other companies, individuals, U.S. Government agencies, and foreign countries. EXCLUDE domestic intra-company transfers and sales by foreign subsidiaries.	101			102		
	Number			Number		
B. Domestic company employment in all activities during the pay period which includes the 12th of March 1996 (Item 1 of I.R.S. Form 941, if Form 941 was filed for the entire company.)	111			112		

Item 2 – NUMBER OF RESEARCH AND DEVELOPMENT SCIENTISTS AND ENGINEERS

	January 1996	January 199
	Number	Number
Apportion on a full-time equivalent basis. *See instruction booklet for more detail.* →	501	502

Item 3 – REPORT COSTS INCURRED FOR RESEARCH AND DEVELOPMENT

(Report in thousands of dollars)

	1995									1996								
	Federal (1)			Company and other (2)			Total ((1)+(2)) (3)			Federal (4)			Company and other (5)			Total ((4)+(5)) (6)		
A. Performed within the company	Bil.	Mil.	Thou.	Bil.	Mil.	Thou.	Bil.	Mil.	Thou.	Bil.	Mil.	Thou.	Bil.	Mil.	Thou.	Bil.	Mil.	Thou.
1. Basic research – *If "NONE," please mark (X) here and enter 0 (zero) where appropriate.* → 300 ☐	301			302			303			304			305			306		
2. Applied research and development – a. Applied research	311			312			313			314			315			316		
b. Development	321			322			323			324			325			326		
c. **Total** – *Sum of lines a and b*	331			332			333			334			335			336		
3. **Total** – *Sum of lines 1 and 2c.*	341			342			343			344			345			346		
B. Outside the company – **Federal** funds and **company** funds for research and development **performed by others** outside the company **within the United States** *(Exclude from 3A.3. above)*				352						354			355			356		
C. Foreign – **Company** funds for research and development **performed by foreign subsidiaries** or other organizations **outside the United States** *(Exclude from 3A.3. and 3B. above)*				362									365					
D. TOTAL – Company and other funds, except Federal (This line represents company sponsored research and development with the exception of "other funds".)– *Sum of 3A.3 (column 2), B, and C)* →				372									375					

Item 4 – COMPANY AND OTHER FUNDS, EXCEPT FEDERAL, FOR RESEARCH AND DEVELOPMENT PERFORMED WITHIN THE COMPANY BUDGETED FOR THE YEAR 1997

(Comparable to the 1996 figure reported in item 3A.3., column (5).)

Bil.	Mil.	Thou.
401		

Item 5 – COVERAGE AND OPERATIONAL STATUS

Are research and development costs for the entire domestic enterprise, including subsidiaries, reported on this form?

1301 ☐ Yes
1302 ☐ No – *Please explain on the back of the page.*

PLEASE CONTINUE ON REVERSE SIDE

New owner information (See instructions for Coverage Review.) [illegible]

602 **Name**

603 **Address** *(Number and street)*

604 City

605 **State** | 606 **ZIP Code**

▶ Item 6 – CERTIFICATION – This report is substantially accurate and has been prepared in accordance with instructions

Name of person to contact regarding this report	Area code	Number	Extension

Signature of authorized official	Title	701 Date

REMARKS

801 (If you wish to correspond by E-mail, please put your E-mail address here.)

FORM **RD-1-S(I)**
(1-30-97)

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
COLLECTING AND COMPILING AGENT FOR
THE NATIONAL SCIENCE FOUNDATION
WASHINGTON, DC 20233

INSTRUCTIONS FOR SURVEY OF INDUSTRIAL RESEARCH AND DEVELOPMENT DURING 1996

FORM RD-1(S)

Page

General Instructions 2

Definition of Research and Development 3

Item by Item Instructions 3

- Item 1 – Receipts and Employment for Company 4
- Item 2 – Number of Research and Development Scientists and Engineers 4
- Item 3 – Report Costs Incurred for Research and Development 4
- Item 4 – Company and other Funds, Except Federal, for Research and Development Performed Within the Company Budgeted for the Year 1997 6
- Item 5 – Coverage and Operational Status 6
- Item 6 – Certification 6

HIGHLIGHTS FOR THE 1996 SURVEY

For the first time, the National Science Foundation and the U.S. Census Bureau are requesting information on **Federally-funded research and development subcontracted to outside organizations**. Please see Item 3.B in the Item by Item Instructions for a detailed description.

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GENERAL INSTRUCTIONS

Comprehensive and timely information about the nature and support of corporate research and development activities is an important component in the overall assessment of our nation's scientific and technological resources. The information you provide is used to prepare national measures of industrial research and development (R&D) not available from any other source. By carefully completing this report, the accuracy of this information is assured.

DUE DATE – Please complete and return this form in the envelope provided within 60 days. Make a copy for your records.

SURVEY SCOPE – This report covers privately-owned, nonfarm business firms in all sectors of the United States economy. It does not include operations owned by Federal, state or local governments, nonprofit organizations, or trust or pension plans.

If your company is owned by a Federal, state or local government, is a nonprofit organization, or is a trust or pension plan which performs no activity other than investments, do not report. Please note in the remarks section on the back page of the form and return it.

REPORTING ENTITY – Report research and development activities for all domestic operations of your **entire consolidated domestic enterprise**, including subsidiaries and divisions. The term "company" in these instructions refers to the consolidated domestic enterprise. Report for all parts of the company located in the 50 states and the District of Columbia. Report net receipts and employment figures for all parts of the company, even those that do not perform R&D, as long as they are located in the 50 states or the District of Columbia.

If this form has been directed to a holding company, report for all subsidiaries and operations under the ownership and control of the holding company.

If you report separately for a component of this company based upon an arrangement with the Census Bureau, please continue to do so.

COVERAGE REVIEW – Check the appropriate box if this company was owned or controlled by another company on December 31, 1996. If yes, follow the instructions below:

- If you have been reporting separately for this component of the company based upon an arrangement with the Census Bureau, please complete the form.
- If your company is owned by a foreign company, please complete the form and fill out the new owner information on the back page of the form.
- If your company was purchased by another company prior to March 31, 1996, please complete the new owner information on the back page of the form, sign the form in item 6, and fax the form to (301) 457–1318.
- If your company was purchased after March 31, 1996, please complete the form for the months prior to the purchase of your company and fill out the new owner information on the back page of the form.

If you have questions, please call the R&D Survey staff at (301) 457-4677 to determine whether you are required to complete the form.

PERIOD COVERED BY THE REPORT – Report figures for calendar year 1996. Fiscal year data are acceptable for all items except for employment, provided your fiscal year ends between September 1996 and March 1997. Please report employment figures (Items 1B and 2) for the specific times indicated for these items.

HOW TO REPORT – Report all value figures in thousands of dollars. If you cannot answer a question from your company records, please estimate the answer carefully.

Example: 1,123,678,599 dollars.

	Bil.	Mil.	Thou.
Report	$1	123	679

If you estimate your answers in millions of dollars, please fill the thousands box with zeros.

Example: 1,124

	Bil.	Mil.	Thou.
Report	$1	124	000

FIGURES FOR 1995 PRINTED ON THE FORM – If your company reported for 1995, entries from that form have been printed on the present form. If these figures are incorrect, please revise them. Please describe in the "Remarks" section the reasons for any substantial increase or decrease in the 1996 figures entered on this form when compared to corresponding 1995 figures or changes in the 1995 figures. Examples of such reasons are new government contracts, acquisitions and divestitures, and revised accounting method. If you acquired or disposed of a unit performing an important amount of research and development during the 2-year period, please identify the unit in "Remarks," and give the total amount of research and development accounted for by that unit.

ADDITIONAL FORMS – Photocopies of this form are acceptable. If you require additional forms, write to the Bureau of the Census, 1201 East 10th Street, Jeffersonville, IN 47132-0001 or call (812) 288–3331.

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GENERAL INSTRUCTIONS – Continued

FILING EXTENSIONS – If you cannot complete the form in 60 days, request an extension of time by:

- calling the Census Touchtone Data Entry System on 1-800-851-2014 (have your 10-digit Census File Number, "CFN", available. The CFN is printed on the form above your address.)

OR

- writing to the address below (Please include your 10-digit Census File Number):

Bureau of the Census
1201 East 10th Street
Jeffersonville, IN 47132-0001

ALTERNATIVE REPORTING FORMATS – Along with the survey form, some companies received a computer diskette. Reporting your company information on the diskette is an alternative means of completing the survey. If you do report on the diskette do not mail in the paper form. Receiving your data on diskette benefits us through reduced processing costs. Please refer questions concerning operation of the diskette to the Electronic Reporting Staff at (301) 457–4125.

BURDEN HOUR ESTIMATE – Public reporting burden for this collection of information is estimated to average 20 hours per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimates or any other aspects of this collection of information including suggestions for reducing this burden to Herman G. Fleming, National Science Foundation, 4201 Wilson Boulevard, Room 485, Arlington, VA 22230.

Direct **QUESTIONS** regarding this form to the Bureau of the Census, Manufacturing and Construction Division, ATTN.: Special Studies Branch, Room 2135/4, Washington, DC 20233–6900, call (301) 457–1339 or E-mail to suzanne.p.troske@ccmail.census.gov. (Please see page 6 for E-mail warning.)

DEFINITION OF RESEARCH AND DEVELOPMENT

R&D includes basic and applied research in the sciences and engineering. It also includes design and development of new products and processes and enhancement of existing products and processes.

R&D includes activities carried on by persons trained, either formally or by experience, in the physical sciences such as chemistry and physics, the biological sciences such as medicine, and engineering and computer science. R&D includes these activities if the purpose is to do one or more of the following things:

1. Pursue a planned search for **new knowledge**, whether or not the search has reference to a specific application. (Basic research)
2. Apply **existing knowledge** to problems involved in the **creation of a new product or process**, including work required to evaluate possible uses. (Applied research)
3. Apply **existing knowledge** to problems involved in the **improvement of a present product or process**. (Development)

Research and development includes the activities described above whether assigned to separate R&D organizational units of the company or carried out by company laboratories and technical groups not part of an R&D organization. Reporting the R&D activities of such latter groups may require the use of estimates for some of your responses.

Activities to be **excluded** from R&D:

- Routine product testing
- Geological and geophysical exploration activities
- Technical services such as:
    - quality and quantity control
    - technical plant sanitation control
    - trouble-shooting in connection with breakdowns in full-scale production
- Advertising programs to promote or demonstrate new products or processes
- Assistance in preparation of speeches and publications for persons not engaged in research and development.
- Agricultural R&D
- Social Science R&D which is defined to encompass those activities devoted to further understanding the behavior of groups of human beings or of individuals as members of groups. Some of the topics include the following:
    - Personnel R&D
    - Economic R&D
    - Artificial intelligence and expert systems R&D
    - Consumer, market, and opinion R&D
    - Engineering psychology R&D
    - Management and organization R&D
    - Actuarial and demographic R&D
    - Educational processes and applications R&D
    - R&D in law

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ITEM BY ITEM INSTRUCTIONS

Item 1 – RECEIPTS AND EMPLOYMENT FOR THE COMPANY

Item 1A – Sales, Operating Receipts and Revenues

Include:

- Sales, operating receipts and revenues from all domestic operations of the company. This includes receipts from sales of products and services provided to other companies, individuals, U.S. Government agencies, and foreign countries.
- Net selling value of shipments, f.o.b. plant, after discounts and allowances minus freight charges and excise taxes
- Revenue from investments, rents, and royalties only if it is the principal business of the company. Finance, Insurance and Real Estate companies should include interest, dividends, commissions and rental income as part of revenues.
- Value of assets sold under a capital lease agreement
- Export transfers to your foreign subsidiaries

Exclude:

- Sales and other taxes collected and paid directly to government taxing agencies
- Domestic intra-company transfers
- Receipts from sale of products and services provided by your foreign subsidiaries
- Income from interest, dividends and commissions, except for Finance, Insurance and Real Estate companies
- Other nonoperating income (e.g., royalties)

Item 1B – Domestic Company Employment

Include:

- The number of full and part-time employees of the company as defined on Treasury Form 941, Employer's Quarterly Federal Tax Return, and Circular E, Employer's Tax Guide, if filed for the entire company.
- The number of employees in all activities in the 50 States and the District of Columbia during the pay period which includes March 12, 1996.
- Persons on paid sick leave, paid holidays, and paid vacations during the pay period which includes March 12, 1996.

Report the number of employees, not payroll.

Item 2 – NUMBER OF RESEARCH AND DEVELOPMENT SCIENTISTS AND ENGINEERS

Scientists and engineers are defined for this survey as all persons engaged in scientific or engineering work at a level which requires a knowledge of physical or life sciences or engineering or mathematics. Their experience is equivalent to completion of a 4-year college course with a major in these fields, regardless of whether or not they actually hold a degree in this field.

The figure on R&D scientists and engineers will be obtained primarily from two sources:

1. For company laboratories performing only research and development, report the number of scientists and engineers employed in January, 1997.
2. For employees whose activities are not solely devoted to R&D, report the proportion of their time that is devoted to R&D. For example, if a company had the full-time equivalent of 60 scientists and engineers in January 1997 and one-fourth of their time was charged to R&D projects, the figure for the number of R&D scientists and engineers for this company would be 15.

Item 3 – REPORT COSTS INCURRED FOR RESEARCH AND DEVELOPMENT

▶ Source of Funds for Research and Development Costs

Federal funds

Include:

- Federally-sponsored research and development performed within the company. Include only the amount of work done on Federal R&D contracts or subcontracts in the current year.
- R&D portion of procurement contracts or subcontracts

Exclude:

- For Item 3A exclude Federal R&D contracts and R&D portions of procurement contracts that your company subcontracted to other R&D organizations. Including these funds would cause duplication in the statistical totals, which include data on work actually performed by each company. Report subcontracted costs in Item 3B.
- Expenditures for independent research and development (IR&D). These are included in company funds. (See definition below.)

Company and other funds

Include:

- Company-sponsored research and development performed within the company and R&D performed under contract from non-Federal sources

Item 3 – REPORT COSTS INCURRED FOR RESEARCH AND DEVELOPMENT – Continued

Company and other funds – Continued

Include:

- Costs for independent research and development (IR&D). We define IR&D funds as R&D performed by the company for which you anticipate reimbursement by the government through indirect charges for the purchase of products or services. Qualified projects usually have potential interest to the Department of Defense or other agencies of the Federal government. These IR&D funds are excluded from federal funds received for federally-sponsored research and development contracts.
- Costs for which you anticipate reimbursement as company funds. Report expenditures in the period for which they are incurred. Do not include the actual reimbursement.

Item 3A – PERFORMED WITHIN THE COMPANY

▶ Types of R&D Costs

Include as R&D costs:

- Wages, salaries, and related costs
- Materials and supplies consumed
- R&D depreciation
- Cost of computer software used in R&D activities
- Utilities, such as telephone, telex, electricity, water, and gas
- Travel costs and professional dues
- Property taxes and other taxes (except income taxes) incurred on account of the R&D organization or the facilities they use
- Insurance expenses
- Maintenance and repair, including maintenance of buildings and grounds
- Company overhead including: personnel, accounting, procurement and inventory, and salaries of research executives not on the payroll of the R&D organization

Exclude as R&D costs:

- Capital expenditures
- Patent expenses
- Income taxes and interest
- R&D performed abroad (see Item 3C), such as in Canada and Puerto Rico
- R&D performed by non-company R&D organizations of any kind (see Item 3B)
- Portion of company-held R&D contracts that are subcontracted outside the reporting company (see Item 3B)
- Fellowships, grants, and gifts to promote R&D or the study of science and engineering

Item 3A.1 – Basic Research

Include the cost of research projects which represent original investigation for the advancement of scientific knowledge and which do not have specific immediate commercial objectives, although they may be in the fields of present or potential interest to the reporting company.

If your company performs no basic research, please check the box in item 3A.1 and report zeros in line 1, columns 4, 5, and 6.

Item 3A.2a – Applied Research

Include the cost of research projects which represent investigation in discovery of new scientific knowledge and which have specific commercial objectives with respect to either products or processes.

Item 3A.2b – Development

Include the cost of projects which represent technical activity concerned with non-routine problems encountered in translating research into products or processes.

Include:

- Software development
- Design and operation of pilot plants and semi-work plants
- Engineering activity required to advance the design of a product or process so it meets specific functional and economic requirements
- Design, construction, and testing of prototypes and models including test models for defense contracts
- Designs for special manufacturing equipment and tools
- Preparation of reports, drawings, formulas, specifications, standard practice instructions, or operating manuals

Exclude:

- Routine technical services to customers
- Toolmaking and tool tryout
- Production of detailed construction drawings and manufacturing blueprints
- Pre-production planning

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ITEM BY ITEM INSTRUCTIONS – Continued

Item 3A.2c – Total Costs for Applied Research and Development

Add line 3A.2a and line 3A.2b.

Item 3A.3 – Total Costs for Basic and Applied Research and Development Performed Within the Company

Add line 3A.1 and line 3A.2c.

▶ Estimating basic, applied, and development expenditures

If your company does not keep records that can be allocated to these specific categories, estimate by the following:

1. Isolate projects that clearly fall into the development category of R&D costs. If your company fabricates products, development activity will include the design, construction, and testing of prototypes and models. If your company's R&D involves the development of a "process" as in chemicals and petroleum, this development activity would primarily include the design and operation of pilot plants or semi-work plants.
2. Isolate the organizational units which have R&D activities that can be readily classified based on the function assigned to the unit. R&D work performed in production units as well as in various laboratories is generally classified as development R&D.
3. Distribute the balance of R&D costs on the basis of individual projects or on the basis of other summaries of the work.

Item 3B – OUTSIDE THE COMPANY

Report payments in the form of contracts, grants, and fellowships made to other industrial firms, commercial laboratories, consultants, educational institutions, hospitals, and research institutions or other organizations.

Federal Funds (column 4): Report R&D activities that your company subcontracted to other organizations using **federal funds** you received for R&D contracts and R&D portions of procurement contracts. This item is new for the 1996 survey.

Company and Other Funds (column 5): Report R&D activities that your company subcontracted to other organizations using **company or other nonfederal funds.**

Item 3C – FOREIGN

Report the amount of R&D financed by the U.S. parent or its foreign subsidiaries, including Canada and Puerto Rico, and performed by company R&D laboratories, branch plants, or other organizations, located outside the United States. Foreign subsidiaries are those outside the 50 States and the District of Columbia.

Exclude R&D activities performed by foreign subsidiaries which were financed by foreign governments or other outside organizations.

Item 3D – TOTAL

With the exception of "Other funds," this number represents company-sponsored R&D. It is comparable to information reported on Form 10K, if you report to the Securities and Exchange Commission.

Add line 3A.3 (column 5), line 3B (column 5) , and line 3C.

Item 4 – COMPANY AND OTHER FUNDS, EXCEPT FEDERAL, FOR R&D PERFORMED WITHIN THE COMPANY BUDGETED FOR THE YEAR 1997

Report the estimated cost of company and other nonfederally sponsored R&D that will be performed within the 50 states and the District of Columbia in 1997. This item is comparable to the 1996 figure reported in item 3A.3, column 5.

ITEM 5 – COVERAGE AND OPERATIONAL STATUS

Check the appropriate box. If no, please explain in the remarks section.

New owner information

If the company was owned or controlled by another company on December 31, 1996, provide the name and address of the new owner and the date acquired. In the "Remarks" section, specify the change or correction, e.g., wholly-owned subsidiary of ABC Company", "merger with XYZ Company", "acquired by 123 Corporation". For questions, please see "COVERAGE REVIEW" in the General Instructions.

ITEM 6 – CERTIFICATION

Report the name and telephone number of the person to contact regarding this report. Please sign and date the form.

If you wish to correspond by E-mail, please put your E-mail address in the remarks section.

WARNING CONCERNING ELECTRONIC MAIL: The Internet is not a secure means of transmitting information unless it is encrypted. If you choose to communicate with the Census Bureau via electronic mail, the Census Bureau cannot guarantee the privacy of the information while transmitted, but will safeguard it in accordance with Title 13. Be advised that making inquiries regarding this survey via electronic mail may divulge your participation in this survey.

☆U.S. GOVERNMENT PRINTING OFFICE: 1997 - 549-111/40135

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PLEASE RETURN BY:

OMB No. 3145-0027: Approval Expires 1/31/99

NOTICE — Your report to the Census Bureau is **confidential** by law (title 13, U.S. Code).

FORM **RD-1A**
(2-3-97)

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS

SURVEY OF INDUSTRIAL RESEARCH AND DEVELOPMENT DURING 1996

In correspondence pertaining to this report refer to this **CENSUS FILE NUMBER (10 digits)** ▶

The instructions and definitions on this form are not complete. Please read the enclosed instruction sheet before completing this form.

RETURN TO

▼

BUREAU OF THE CENSUS
1201 East 10th Street
Jeffersonville, IN 47132-0001

Data supplied in items 2A and B and in item 3A.3, columns 1 and 3 for 1996 on this form will satisfy the mandatory reporting requirements (title 13, U.S. Code).

FROM THE DIRECTOR
BUREAU OF THE CENSUS

We have enclosed your company's report form and instructions for the 1996 "Survey of Industrial Research and Development." **Please read the definition of R&D on page 1 of the form** and review Item 1. If your company does not conduct R&D or had no R&D expenditures in 1996, please call the Touchtone Data Entry system (TDE) to report on 1–800–851–2014.

If your company conducted research and development in 1996, please review the instructions, complete the form, and return it within 60-days. Federal law requires your responses to four items identified on the form. Your voluntary responses to all other items are needed to assure useful results.

This survey provides information for examining R&D tax credits which may allow some businesses to reduce their Federal tax burden. The data assist public officials in allocating research funding by state which may well benefit companies like yours. Analysts also use the results to compare R&D spending in this country with others to ensure that U.S. businesses are not at a competitive disadvantage.

Information you report should cover the domestic operations of your consolidated enterprise for calendar year 1996. We recognize that providing this information is a burden, and we have worked hard to minimize it. For example, if you do not have book records for any item, **you may provide carefully prepared estimates.** The law that authorizes this survey (Title 13, United States Code) requires that we keep your report in full confidence. Only sworn Census Bureau employees will see your information, and they will use it only for statistical purposes.

We conduct this survey with National Science Foundation (NSF) support. We have enclosed a letter from the Director of the NSF encouraging your response to the survey. If you have any questions, please call my staff on 301–457–1339. Thank you in advance for your cooperation.

Sincerely,

Martha Farnsworth Riche

Martha Farnsworth Riche

PLEASE OPEN AND BEGIN THE SURVEY WITH ITEM 1.

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RESEARCH AND DEVELOPMENT

R&D includes basic and applied research in the sciences and engineering. It also includes design and development of new products and processes and enhancement of existing products and processes.

R&D includes activities carried on by persons trained, either formally or by experience, in the physical sciences such as chemistry and physics, the biological sciences such as medicine, and engineering and computer science. R&D includes these activities if the purpose is to do one or more of the following things:

1. Pursue a planned search for **new knowledge**, whether or not the search has reference to a specific application. (Basic Research)
2. Apply **existing knowledge** to problems involved in the **creation of a new product or process** including work required to evaluate possible uses. (Applied Research)
3. Apply **existing knowledge** to problems involved in the **improvement of a present product or process**. (Development)

Research and development includes the activities described above whether assigned to separate R&D organizational units of the company or carried out by company laboratories and technical groups not part of an R&D organization. Reporting the R&D activities of such latter groups may require the use of estimates for some of your responses.

Activities to be **excluded** from R&D are as follows: research in social sciences or psychology, routine product testing, geological and geophysical exploration activities and technical services.

See instructions for more detail.

Item 1 – CHECK FOR RESEARCH AND DEVELOPMENT

Mark (X) the appropriate box.

201 ☐ Company had R&D in 1996 – *Complete form, enter zeros where applicable, and return this form.*
202 ☐ Company had no R&D in 1996, but has in the past and may in the future – *Call TDE to report (1–800–851–2014). Do not mail form.*
203 ☐ Company does not conduct R&D – *Call TDE to report (1–800–851–2014). Do not mail form.*

NOTE – After reviewing item 1 if you need further assistance please call (301) 457–1339.

Item 2 – RECEIPTS, EMPLOYMENT AND NUMBER OF SCIENTISTS AND ENGINEERS FOR COMPANY

	1996			
	Bil.	Mil.	Thou.	Dol.
A. Net sales, operating receipts and revenues of domestic operations of this company. (Report in thousands of dollars) **INCLUDE** receipts for sales of products and services provided to other companies, individuals, U.S. Government agencies, and foreign countries from all domestic operations of your company.	102 $			000

	1996
	Number
B. Report domestic company employment in all activities during the pay period which includes the 12th of March 1996. (Item 1 of I.R.S. Form 941, if Form 941 was filed for the entire company.)	112

	January 1997
	Number
C. Report the full-time equivalent number of R&D scientists and engineers employed in January 1997. For employees whose activities are not solely devoted to research and development, report the proportion of their time that is devoted to research and development. *(See instructions for examples)*	502

Item 3 – REPORT COSTS INCURRED FOR RESEARCH AND DEVELOPMENT IN 1996

	Source of funds											
	Federal (1)				Company and other (2)				Total ((1) + (2)) (3)			
A. Performed within the company	Bil.	Mil.	Thou.	Dol.	Bil.	Mil.	Thou.	Dol.	Bil.	Mil.	Thou.	Dol.
1. Basic research *If "None," please mark (X)* → 300 ☐	304 $			000	305 $			000	306 $			000
2. Applied research and development **a.** Applied research	314 $			000	315 $			000	316 $			000
b. Development	324 $			000	325 $			000	326 $			000
c. Total *(Sum of lines a and b)* →	334 $			000	335 $			000	336 $			000
3. TOTAL *(Sum of lines 1 and 2c)* →	344 $			000	345 $			000	346 $			000
B. Outside the company – **Federal** funds and **company** funds for research and development **performed by others** outside the company **within the United States** *(Exclude from 3A.3 above)*	354 $			000	355 $			000	355 $			000
C. Foreign – **Company** funds for research and development **performed by foreign subsidiaries** or other organizations **outside the United States** *(Exclude from 3A.3 and 3B above)*					365 $			000				
D. TOTAL – Company and other funds, except Federal *(This line represents company sponsored research and development with the exception of "other funds.") (Sum of 3A.3 (column 2), B, and C)* →					375 $			000				

Item 4 – COMPANY AND OTHER FUNDS, EXCEPT FEDERAL, FOR RESEARCH AND DEVELOPMENT PERFORMED WITHIN THE COMPANY BUDGETED FOR THE YEAR 1997

Bil.	Mil.	Thou.	Dol.
401 $			000

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Item 5A – COVERAGE AND OPERATIONAL STATUS

Are research and development costs for the entire consolidated domestic enterprise, including subsidiaries, reported on this form?

☐ Yes ☐ No – *Please explain in remarks below.*

Was this company owned or controlled by another company on December 31, 1996?

☐ Yes – *Complete 5B.* Date acquired ⟶ 601 Month | Year ☐ No

Item 5B – NEW OWNER INFORMATION (See instructions for Coverage Review)

602 Name	603 Address

604 City	605 State	606 ZIP Code

CHECK ITEM Please complete the checks listed below BEFORE returning this questionnaire. By checking these items you will reduce the likelihood of our calling you to resolve an error or inconsistency.

	Yes	No
In item 2A:		
1. Sales is reported in **thousands** of dollars	☐	☐
In item 2B:		
2. Your answer describes the number of **employees**, NOT company payroll	☐	☐
In item 3:		
3. Verify that **Federal funds** (column 1) plus **Company funds** (column 2) equals **Total funds** (column 3) for: Basic research (3A.1), applied research (3A.2a), development (3A.2b), total applied research and development (3A.2c), and total costs within the company (3A.3)	☐	☐

IF THE ANSWER TO ANY OF THE ABOVE CHECKS IS "NO", PLEASE MAKE THE NECESSARY CORRECTIONS IN THE APPROPRIATE ITEM(S) OR PROVIDE AN EXPLANATION IN THE REMARKS SECTION.

Item 6 – CERTIFICATION – This report is substantially accurate and has been prepared in accordance with instructions.

Name of person to contact regarding this report	Area code	Number	Extension

Signature of authorized official	Title	701 Date

801 Remarks (If you wish to correspond by E-mail, please place your E-mail address here.)

FORM RD-1A(I)
(2-7-97)

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
COLLECTING AND COMPILING AGENT FOR
THE NATIONAL SCIENCE FOUNDATION
WASHINGTON, DC 20233

INSTRUCTIONS FOR SURVEY OF INDUSTRIAL RESEARCH AND DEVELOPMENT DURING 1996
FORM RD-1A

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Item 6 – Certification 6

HIGHLIGHTS FOR THE 1996 SURVEY

For the first time, the National Science Foundation and the U.S. Census Bureau are requesting information on **Federally-funded research and development subcontracted to outside organizations**. Please see Item 3.B in the Item by Item Instructions for a detailed description.

GENERAL INSTRUCTIONS

Comprehensive and timely information about the nature and support of corporate research and development activities is an important component in the overall assessment of our nation's scientific and technological resources. The information you provide is used to prepare national measures of industrial research and development (R&D) not available from any other source. By carefully completing this report, the accuracy of this information is assured.

DUE DATE – Please complete and return this form in the envelope provided within 60 days. Make a copy for your records.

SURVEY SCOPE – This report covers privately-owned, nonfarm business firms in all sectors of the United States economy. It does not include operations owned by Federal, state or local governments, nonprofit organizations, or trust or pension plans.

If your company is owned by a Federal, state or local government, is a nonprofit organization, or is a trust or pension plan which performs no activity other than investments, do not report. Please note in the remarks section on the back page of the form and return it.

REPORTING ENTITY – Report research and development activities for all domestic operations of your **entire consolidated domestic enterprise**, including subsidiaries and divisions. The term "company" in these instructions refers to the consolidated domestic enterprise. Report for all parts of the company located in the 50 states and the District of Columbia. Report net receipts and employment figures for all parts of the company, even those that do not perform R&D, as long as they are located in the 50 states or the District of Columbia.

If this form has been directed to a holding company, report for all subsidiaries and operations under the ownership and control of the holding company.

COVERAGE REVIEW – Check the appropriate box if this company was owned or controlled by another company on December 31, 1996. If yes, follow the instructions below:

- If your company is owned by a foreign company, please complete the form and fill out the new owner information on the back page of the form.
- If your company was purchased by another company prior to March 31, 1996, please complete the new owner information on the back page of the form, sign the form in item 6, and fax the form to (301) 457–1318.
- If your company was purchased after March 31, 1996, please complete the form for the months prior to the purchase of your company and fill out the new owner information on the back page of the form.

If you have questions, please call the R&D Survey staff at (301) 457-4677 to determine whether you are required to complete the form.

PERIOD COVERED BY THE REPORT – Report figures for calendar year 1996. Fiscal year data are acceptable for all items except for employment, provided your fiscal year ends between September 1996 and March 1997. Please report employment figures (Items 2B and 2C) for the specific times indicated for these items.

HOW TO REPORT – Report all value figures in thousands of dollars. If you cannot answer a question from your company records, please estimate the answer carefully.

Example: 1,123,678,599 dollars.

	Bil.	Mil.	Thou.	Dol.
Report	$1	123	679	000

If you estimate your answers in millions of dollars, please fill the thousands box with zeros.

Example: 1,124

	Bil.	Mil.	Thou.	Dol.
Report	$1	124	000	000

ADDITIONAL FORMS – Photocopies of this form are acceptable. If you require additional forms, write to the Bureau of the Census, 1201 East 10th Street, Jeffersonville, IN 47132-0001 or call (812) 288–3331.

FILING EXTENSIONS – If you cannot complete the form in 60 days, request an extension of time by:

- calling the Census Touchtone Data Entry System on 1-800-851-2014 (have your 10-digit Census File Number, "CFN", available. The CFN is printed on the form above your address.)

OR

- writing to the address below (Please include your 10-digit Census File Number):

Bureau of the Census
1201 East 10th Street
Jeffersonville, IN 47132-0001

BURDEN HOUR ESTIMATE – Public reporting burden for this collection of information is estimated to average 20 hours per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimates or any other aspects of this collection of information including suggestions for reducing this burden to Herman G. Fleming, National Science Foundation, 4201 Wilson Boulevard, Room 485, Arlington, VA 22230.

Direct **QUESTIONS** regarding this form to the Bureau of the Census, Manufacturing and Construction Division, ATTN.: Special Studies Branch, Room 2135/4, Washington, DC 20233–6900, call (301) 457–1339 or E-mail to suzanne.p.troske@ccmail.census.gov. (Please see item 6 in the instructions for E-mail warning.)

DEFINITION OF RESEARCH AND DEVELOPMENT

R&D includes basic and applied research in the sciences and engineering. It also includes design and development of new products and processes and enhancement of existing products and processes.

R&D includes activities carried on by persons trained, either formally or by experience, in the physical sciences such as chemistry and physics, the biological sciences such as medicine, and engineering and computer science. R&D includes these activities if the purpose is to do one or more of the following things:

1. Pursue a planned search for **new knowledge**, whether or not the search has reference to a specific application. (Basic research)
2. Apply **existing knowledge** to problems involved in the **creation of a new product or process**, including work required to evaluate possible uses. (Applied research)
3. Apply **existing knowledge** to problems involved in the **improvement of a present product or process**. (Development)

Research and development includes the activities described above whether assigned to separate R&D organizational units of the company or carried out by company laboratories and technical groups not part of an R&D organization. Reporting the R&D activities of such latter groups may require the use of estimates for some of your responses.

Activities to be **EXCLUDED** from R&D:

- Routine product testing
- Geological and geophysical exploration activities
- Technical services such as:
    - quality and quantity control
    - technical plant sanitation control
    - trouble-shooting in connection with breakdowns in full-scale production
- Advertising programs to promote or demonstrate new products or processes
- Assistance in preparation of speeches and publications for persons not engaged in research and development.
- Agricultural R&D
- Social Science R&D which is defined to encompass those activities devoted to further understanding the behavior of groups of human beings or of individuals as members of groups. Some of the topics include the following:
    - Personnel R&D
    - Economic R&D
    - Artificial intelligence and expert systems R&D
    - Consumer, market, and opinion R&D
    - Engineering psychology R&D
    - Management and organization R&D
    - Actuarial and demographic R&D
    - Educational processes and applications R&D
    - R&D in law

ITEM BY ITEM INSTRUCTIONS

Item 1 – CHECK FOR RESEARCH AND DEVELOPMENT

Check the box that best describes the R&D activities of your company. If your company performed R&D in 1996 then check box 201 and continue with item 2.

If your company did not conduct R&D in 1996 then call the Census Touchtone Data Entry system at **1–800–851–2014** to complete the survey. Have your 10-digit Census File Number (CFN) ready before calling. The CFN is located above the address. This system will allow you to report that your company performed no R&D in 1996. Do not mail in the form.

Alternatively, check the appropriate box, 202 or 203, on the form. Do not complete the data items. Go to item 6, sign and return the form in the envelope provided. **You must call or mail in the form to complete your reporting requirements for the survey.**

Item 2 – RECEIPTS, EMPLOYMENT AND NUMBER OF SCIENTISTS AND ENGINEERS FOR COMPANY

Item 2A – Net Sales, Operating Receipts and Revenues

Include:

- Sales, operating receipts and revenues from all domestic operations of the company. This includes receipts from sales of products and services provided to other companies, individuals, U.S. Government agencies, and foreign countries.
- Net selling value of shipments, f.o.b. plant, after discounts and allowances minus freight charges and excise taxes
- Revenue from investments, rents, and royalties only if it is the principal business of the company. Finance, Insurance and Real Estate companies should include interest, dividends, commissions and rental income as part of revenues.
- Value of assets sold under a capital lease agreement
- Export transfers to your foreign subsidiaries

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ITEM BY ITEM INSTRUCTIONS – Continued

Item 2A – Net Sales, Operating Receipts and Revenues – Continued

Exclude:

- Sales and other taxes collected and paid directly to government taxing agencies
- Domestic intra-company transfers
- Receipts from sale of products and services provided by your foreign subsidiaries
- Income from interest, dividends and commissions, except for Finance, Insurance and Real Estate companies
- Other nonoperating income (e.g., royalties)

Item 2B – Domestic Company Employment

Include:

- The number of full and part-time employees of the company as defined on Treasury Form 941, Employer's Quarterly Federal Tax Return, and Circular E, Employer's Tax Guide, if filed for the entire company.
- The number of employees in all activities in the 50 States and the District of Columbia during the pay period which includes March 12, 1996.
- Persons on paid sick leave, paid holidays, and paid vacations during the pay period which includes March 12, 1996.

Report the number of employees, not payroll.

Item 2C – Number of Research and Development Scientists and Engineers

Scientists and engineers are defined for this survey as all persons engaged in scientific or engineering work at a level which requires a knowledge of physical or life sciences or engineering or mathematics. Their experience is equivalent to completion of a 4-year college course with a major in these fields, regardless of whether or not they actually hold a degree in this field.

The figure on R&D scientists and engineers will be obtained primarily from two sources:

1. For company laboratories performing only research and development, report the number of scientists and engineers employed in January, 1997.
2. For employees whose activities are not solely devoted to R&D, report the proportion of their time that is devoted to R&D. For example, if a company had the full-time equivalent of 60 scientists and engineers in January 1997 and one-fourth of their time was charged to R&D projects, the figure for the number of R&D scientists and engineers for this company would be 15.

Item 3 – REPORT COSTS INCURRED FOR RESEARCH AND DEVELOPMENT

▶ Source of Funds for Research and Development Costs

Federal funds

Include:

- Federally-sponsored research and development performed within the company. Include only the amount of work done on Federal R&D contracts or subcontracts in the current year.
- R&D portion of procurement contracts or subcontracts

Exclude:

- For Item 3A exclude Federal R&D contracts and R&D portions of procurement contracts that your company subcontracted to other R&D organizations. Including these funds would cause duplication in the statistical totals, which include data on work actually performed by each company. Report subcontracted costs in Item 3B.
- Expenditures for independent research and development (IR&D). These are included in company funds. (See definition below.)

Company and other funds

Include:

- Company-sponsored research and development performed within the company and R&D performed under contract from non-Federal sources
- Costs for independent research and development (IR&D). We define IR&D funds as R&D performed by the company for which you anticipate reimbursement by the government through indirect charges for the purchase of products or services. Qualified projects usually have potential interest to the Department of Defense or other agencies of the Federal government. These IR&D funds are excluded from federal funds received for federally-sponsored research and development contracts.
- Costs for which you anticipate reimbursement as company funds. Report expenditures in the period for which they are incurred. Do not include the actual reimbursement.

Item 3A – PERFORMED WITHIN THE COMPANY

▶ Types of R&D Costs

Include as R&D costs:

- Wages, salaries, and related costs
- Materials and supplies consumed
- R&D depreciation

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ITEM BY ITEM INSTRUCTIONS – Continued

Item 3A – PERFORMED WITHIN THE COMPANY – Continued

▶ Types of R&D Costs – Continued

Include as R&D costs – Continued:

- Cost of computer software used in R&D activities
- Utilities, such as telephone, telex, electricity, water, and gas
- Travel costs and professional dues
- Property taxes and other taxes (except income taxes) incurred on account of the R&D organization or the facilities they use
- Insurance expenses
- Maintenance and repair, including maintenance of buildings and grounds
- Company overhead including: personnel, accounting, procurement and inventory, and salaries of research executives not on the payroll of the R&D organization

Exclude as R&D costs:

- Capital expenditures
- Patent expenses
- Income taxes and interest
- R&D performed abroad (see Item 3C), such as in Canada and Puerto Rico
- R&D performed by non-company R&D organizations of any kind (see Item 3B)
- Portion of company-held R&D contracts that are subcontracted outside the reporting company (see Item 3B)
- Fellowships, grants, and gifts to promote R&D or the study of science and engineering

Item 3A.1 – Basic Research

Include the cost of research projects which represent original investigation for the advancement of scientific knowledge and which do not have specific immediate commercial objectives, although they may be in the fields of present or potential interest to the reporting company.

If your company performs no basic research, please check the box in item 3A.1 and report zeros in line 1, columns 1, 2 and 3.

Item 3A.2a – Applied Research

Include the cost of research projects which represent investigation in discovery of new scientific knowledge and which have specific commercial objectives with respect to either products or processes.

Item 3A.2b – Development

Include the cost of projects which represent technical activity concerned with non-routine problems encountered in translating research into products or processes.

Include:

- Software development
- Design and operation of pilot plants and semi-work plants
- Engineering activity required to advance the design of a product or process so it meets specific functional and economic requirements
- Design, construction, and testing of prototypes and models including test models for defense contracts
- Designs for special manufacturing equipment and tools
- Preparation of reports, drawings, formulas, specifications, standard practice instructions, or operating manuals

Exclude:

- Routine technical services to customers
- Toolmaking and tool tryout
- Production of detailed construction drawings and manufacturing blueprints
- Pre-production planning

Item 3A.2c – Total Costs for Applied Research and Development

Add line 3A.2a and line 3A.2b.

Item 3A.3 – Total Costs for Basic and Applied Research and Development Performed Within the Company

Add line 3A.1 and line 3A.2c.

▶ Estimating basic, applied, and development expenditures

If your company does not keep records that can be allocated to these specific categories, estimate by the following:

1. Isolate projects that clearly fall into the development category of R&D costs. If your company fabricates products, development activity will include the design, construction, and testing of prototypes and models. If your company's R&D involves the development of a "process" as in chemicals and petroleum, this development activity would primarily include the design and operation of pilot plants or semi-work plants.
2. Isolate the organizational units which have R&D activities that can be readily classified based on the function assigned to the unit. R&D work performed in production units as well as in various laboratories is generally classified as development R&D.
3. Distribute the balance of R&D costs on the basis of individual projects or on the basis of other summaries of the work.

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ITEM BY ITEM INSTRUCTIONS – Continued

Item 3B – OUTSIDE THE COMPANY

Report payments in the form of contracts, grants, and fellowships made to other industrial firms, commercial laboratories, consultants, educational institutions, hospitals, and research institutions or other organizations.

Federal Funds (column 1): Report R&D activities that your company subcontracted to other organizations using **federal funds** you received for R&D contracts and R&D portions of procurement contracts. This item is new for the 1996 survey.

Company and Other Funds (column 2): Report R&D activities that your company subcontracted to other organizations using **company or other nonfederal funds.**

Item 3C – FOREIGN

Report the amount of R&D financed by the U.S. parent or its foreign subsidiaries, including Canada and Puerto Rico, and performed by company R&D laboratories, branch plants, or other organizations, located outside the United States. Foreign subsidiaries are those outside the 50 States and the District of Columbia.

Exclude R&D activities performed by foreign subsidiaries which were financed by foreign governments or other outside organizations.

Item 3D – TOTAL

With the exception of "Other funds," this number represents company-sponsored R&D. It is comparable to information reported on Form 10K, if you report to the Securities and Exchange Commission.

Add line 3A.3 (column 2), line 3B (column 2) , and line 3C.

Item 4 – COMPANY AND OTHER FUNDS, EXCEPT FEDERAL, FOR R&D PERFORMED WITHIN THE COMPANY BUDGETED FOR THE YEAR 1997

Report the estimated cost of company and other nonfederally sponsored R&D that will be performed within the 50 states and the District of Columbia in 1997. This item is comparable to the 1996 figure reported in item 3A.3, column 2.

Item 5A – COVERAGE AND OPERATIONAL STATUS

Check the appropriate box indicating whether or not R&D costs for the entire consolidated domestic enterprise, including subsidiaries were reported on this form. If no, please explain in the remarks section.

Check the appropriate box whether this company was owned or controlled by another company on December 31, 1996. If yes, please report the month and year your company was acquired and fill out the new owner information in item 5B. Please see "COVERAGE REVIEW" in the General Instructions for a description of how to proceed in filling out the form.

Item 5B – NEW OWNER INFORMATION

If the company was owned or controlled by another company on December 31, 1996, provide the name and address of the new owner. In the "Remarks" section, specify the change or correction, e.g., wholly-owned subsidiary of ABC Company", "merger with XYZ Company", "acquired by 123 Corporation".

CHECK ITEM

Mark "Yes" or "No" as appropriate for each of the checks in this item. If the answer is "No" provide an explanation in the remarks section.

Item 6 – CERTIFICATION

Report the name and telephone number of the person to contact regarding this report. Please sign and date the form.

If you wish to correspond by E-mail, please put your E-mail address in the remarks section.

WARNING CONCERNING ELECTRONIC MAIL: The Internet is not a secure means of transmitting information unless it is encrypted. If you choose to communicate with the Census Bureau via electronic mail, the Census Bureau cannot guarantee the privacy of the information while transmitted, but will safeguard it in accordance with Title 13. Be advised that making inquiries regarding this survey via electronic mail may divulge your participation in this survey.

*U.S. Government Printing Office: 1997 - 549-111/40127